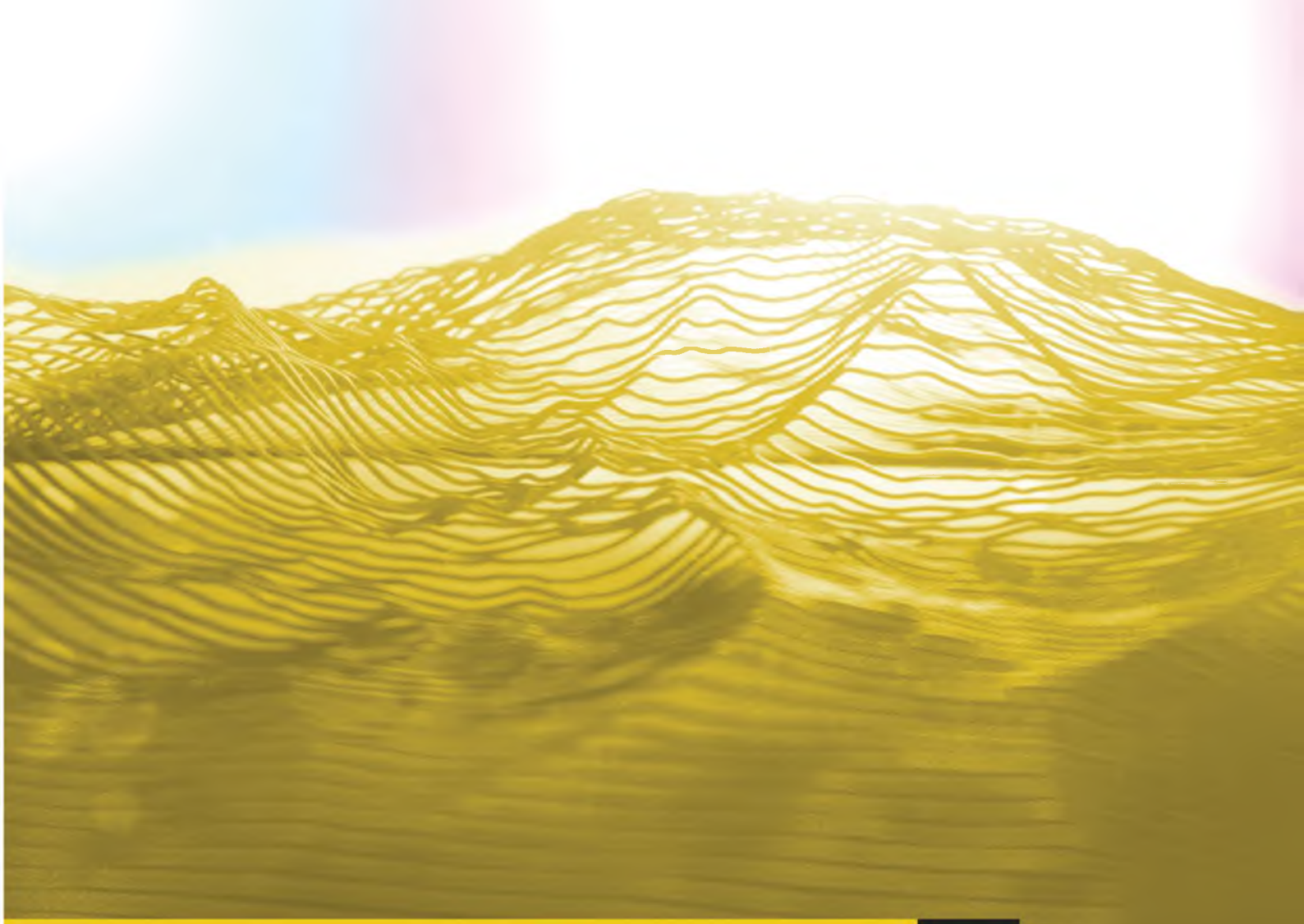

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LOCAL RESEARCH LOCAL SOLUTIONS

Volume VI

POLITICAL ECONOMY OF DEVELOPMENT REFORM

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Edited by Nadeem Ul Haque and Faheem Jehangir Khan

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(VOLUME VI)

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PART I

POLITICAL ECONOMY OF DEVELOPMENT REFORM

Research Papers

POLITICAL DYNASTIES AND LOCAL ECONOMIC DEVELOPMENT IN PAKISTAN

Faiz Ur Rahman, Noman Ahmad and Muhammad Nasir

ABSTRACT

Political dynasties are entrenched in Pakistan's political system. Dynastic legislatures constitute more than 50% 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 the 2002, 2008, and 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.

1. INTRODUCTION

Political dynasties are 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, M., 2009; Querubin, 2011; Mendoza, 2012; Cheema, et al., 2013; Bohlken, & Chandra, 2014). The transfer of political capital increases a dynast heir's electoral advantage over a non-dynast and thereby decreases 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% 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 has intensified among the leaders of the main political parties.[1] Interestingly, until recently, there was no scientific evidence on which this debate is based.[2] This motivated 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 and 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 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 Works Program by the then-Pakistan People Party (PPP) government. Under this programme, 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, 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 the 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

[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 a negative effect on different indicators of economic performance. However, the scope of their studies is limited to the province of Punjab.

[3] The influence of legislatures in local development can be assessed from the fact that the incumbent Pakistan Tehreek-i-Insaf (PTI) government the 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).

considerable influence on 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 the 2002, 2008, & 2013 general elections were used to extract information about a politician's family background. Similarly, different proxies including the growth in night light luminosity, level of wealth and consumption, and access to electricity, gas, telephone, water, and roads at constituency, village, and individual levels were 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, access to public goods (electricity, gas, water, sewerage, and roads) is 25% lower in dynast constituencies than the non-dynast ones. Furthermore, the households in dynast constituencies have 20% 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 on 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 a strong network) that can help a politician get elected, but do not improve his performance in the office. Hence, these are alternatively named “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 political office for future generations. Heritable human capital, thus, gives incumbent parents further incentive to perform well to signal to voters that they and 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, disconnected from ground realities. Moreover, they also inherit political capital (e.g., a prominent name or a powerful network), which they can use to stay 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 resulting in an overall negative effect of dynasties. This suggests that when the subsequent generations of politicians enter 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 that the political elites confront a trade-off between potential economic gains and political power. Ceteris Paribus, they want reform-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 the 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 a lack of political competition will have no threat of losing political power in the 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 utilised different sources on political and economic development variables at the national constituency level across Pakistan.

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 utilizes. 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 defined a politician as a dynast if at least one member of his family[4] was elected as a 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 on Pakistan.

Once defined, the subsequent task was to identify the dynasts' members of parliament. In most countries, there is a systematic pattern in the names of members of a family. A 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 are clan-specific.[6] Therefore, instead of matching surnames, we exploited different sources to identify the familial links of the candidates. Firstly, significant information was extracted from Anjum (1990) and Cheema and Naseer (2013). The remaining data were obtained from the digital newspaper archives. Some of the data were collected from the websites of the national assembly. Furthermore, we also contacted some reporters for the local newspapers to confirm our

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

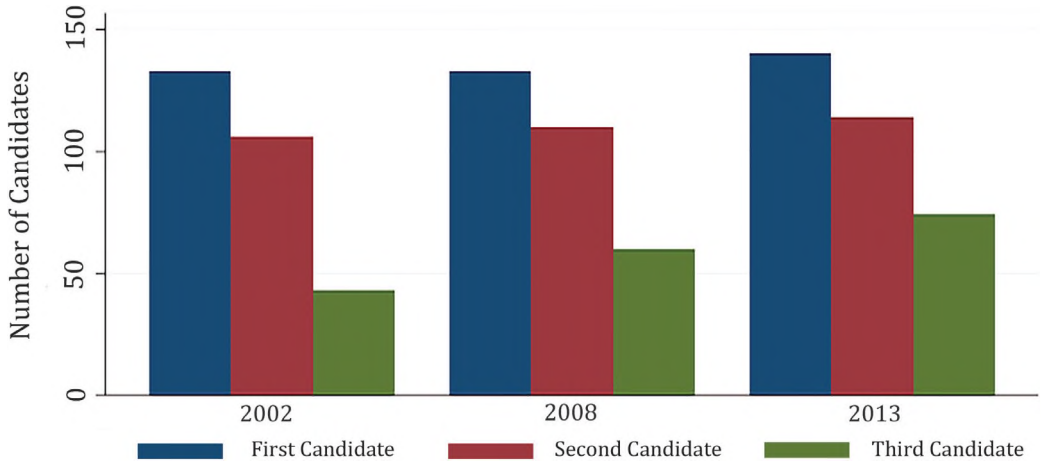
[5] Members of the upper house are elected indirectly through provincial assemblies. So, they do not exercise their power and influence directly.

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

identified dynasties for each constituency.

We collected 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% of winner and 41% of runner-up electoral candidates in the national assembly in the past three elections (2002, 2008, and 2013) belonged to dynastic families. Similarly, on average, 20% of the contesting candidates in each constituency in these three elections were members of dynastic families. These numbers depict the entrenched role of dynastic politics in the electoral process of Pakistan.

Figure 1: Number of Dynastic Candidates in Top Three Contestants of National Assembly



Local Economic Development And The Use Of Nighttime Luminosity

The local economic development was the dependent variable of the study, which can be proxied by various economic variables. Unfortunately, in Pakistan, like many 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 a constituency level. To overcome this limitation, many scholars have explored the possibility of using satellite-based remote sensing, including nighttime illumination imagery at national and subnational levels 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 the use of nightlight luminosity as a proxy for economic growth is. 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 the government footprint in the provision of electricity is 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).

[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.

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

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

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 by using harmonised nightlight data.[10] The study found 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 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 used lights in human settlements in cloud-free composite images produced using all the available archived satellite images of the 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 km2) 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 hand, the value of 63 is the saturation value and indicates the brightest area for each year. For each region, we calculated the average DN and used 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 was then merged with the national constituencies. Table 1 provides descriptive statistics of the night luminosity in 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 nightlights in Pakistan for the years 2002, 2008, and 2013, respectively. The intensity of light was significantly high in the eastern part compared to the rest of the country. Furthermore, these nightlight figures were also extracted for national constituencies for the respective years.

[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 were accessed at https://www.ngdc.noaa.gov/eog/night_sat/nightsat.html

Figure 2: Spatial Concentration of Nightlight in 2002

Figure 3: Spatial Concentration of Nightlight in 2008

Figure 4: Spatial Concentration of Nightlight in 2013

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. These included data on constituency-level variables, such as the number of candidates who contested in the election, voter turnout, voter share of the incumbent candidate, ruling party legislature, the winning margin between the winner and runner-up candidates, and the number of independent candidates. Finally, to further minimise the OVB, which may arise due to time-invariant unobserved heterogeneities, the regressions included district and constituency fixed effects and election (year) fixed effects to check for time-invariant or slow-changing unobservables. Table 2 provides summary statistics of both dependent and control variables, which were utilised in a regression discontinuity (RD) design framework. Interestingly, some constituencies experienced negative nightlight growth, while in others the nightlights grew by as high as 67% during the electoral cycles of 2002-2008 and 2008-2013.

Table 2: Summary Statistics of Dependent and Control Variables

Variables	Mean	S.D.	Min	Max
	RD Variables			
Mean of Nightlight Luminosity	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

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) provides 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 was generated from Rounds 1 and 1.5 (PRHPS, 2012), while political controls were 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, and 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 were randomly selected from each of the 19 rural districts in the provinces of Punjab, Sindh, and Khyber Pakhtunkhwa.[14] These selected mouzas cover 46 of 342 (15%) of the national assembly constituencies of Pakistan. We matched this data with the novel data on constituency-level political

[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 were not included in the sample due to difficult law and order situation. Balochistan and FATA were also excluded from the sample due to security concerns.

dynasties to identify potential mechanisms through which political dynasties could 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 3: 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 Latrine	0.393	0.488	0	1
Pipe Drainage	0.429	0.495	0	1
Pipe Water	0.0606	0.239	0	1
Consumption (Rs.)	34,588.65	41,688.17	5410	117,920
Land Wealth (Rs.)	224,210.3	972,842	0	4.62E+06
Non-Land Wealth (Rs.)	177,462.9	350,763.7	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
Democratic 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 Gas	0.0993	0.299	0	1
Telephone	0.247	0.431	0	1
Paved Road	0.371	0.483	0	1

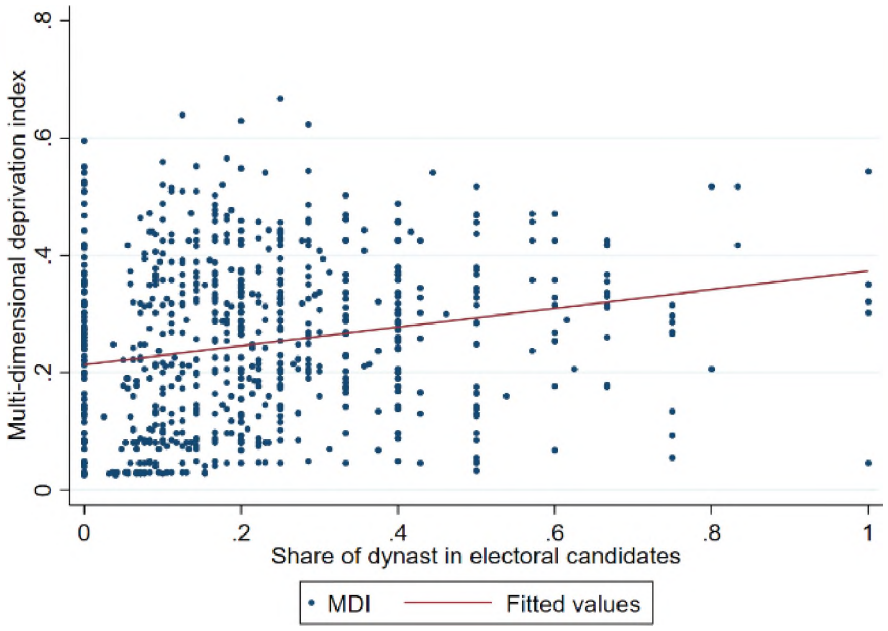
Note: The household infrastructure index is the average value of household access to electricity, tap water, pipe drainage, and flush latrine, while, the village infrastructure index is the average value of village access to electricity, Sui gas, telephone, and paved roads. Similarly, political knowledge is the average value of questions like know/name of 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 STYLIZED FACTS

Before we move to formal empirical analysis, it is important to look at some stylised facts on the connection between dynasties, political competition, and local economic development. This exploration is in line with the conceptual 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 were worse off compared to those with 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.

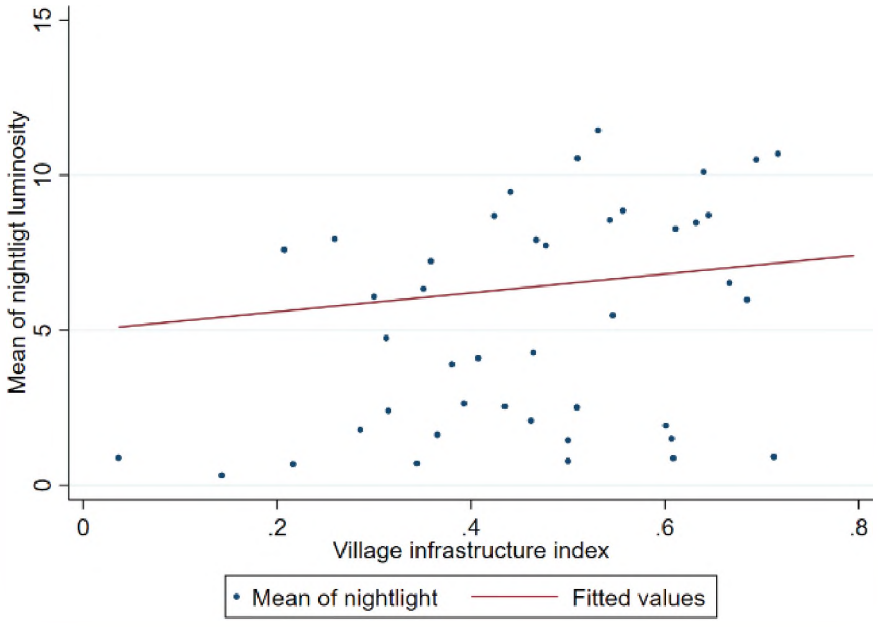
Figure 5: Dynasties and Multidimensional Deprivation Index



Source: Authors' calculations

But does the 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, 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 was 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 of local economic development – can be evidenced by nightlight data.

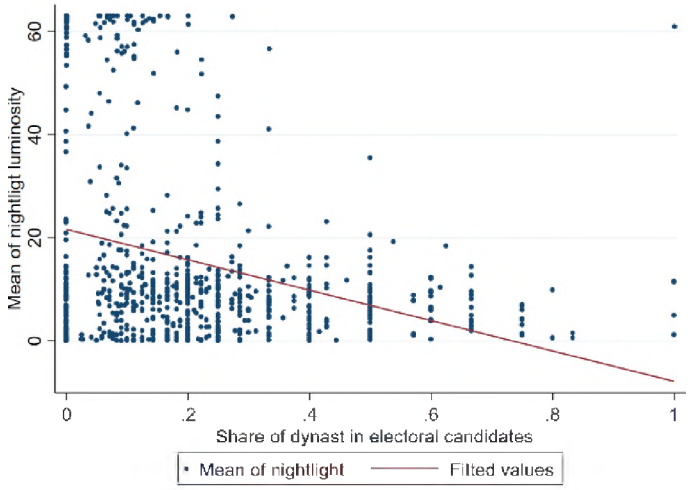
Figure 6: Nightlight Luminosity and Local Economic Development



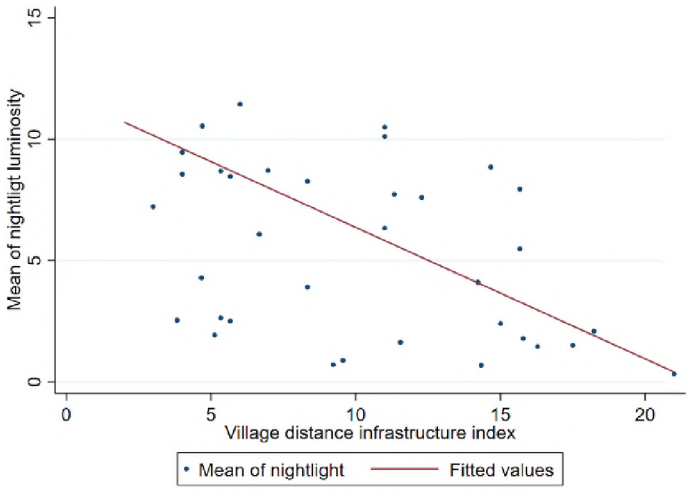
Source: Authors' calculations

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 supports the evidence in Figure 4 that constituencies ruled by dynasts have deteriorated public good provisioning, which results in lower economic development. This is further supported by Panel B (Figure 7), which shows that the distance from institutions of public good provisioning such as schools, healthcare centres, etc., reduces the local economic development.

Figure 7: Dynasties and Local Economic Development



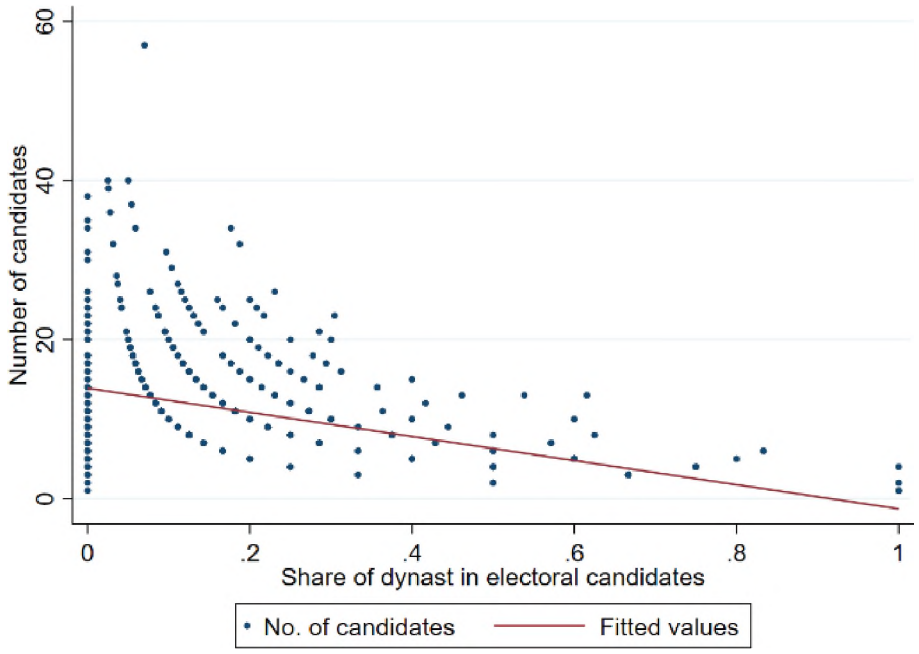
Panel A



Panel B

The stylised facts shown above provide suggestive evidence that constituencies dominated by dynastic politicians are worse off in terms of economic development and the provision of public goods. The question, however, arises that how the increased share of economic dynast candidates hinders 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, the politicians who have some control and power in their constituencies but 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 a maximum limit on election campaign expenditures set 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 descendent dynasts have a lower incentive to deliver.

Figure 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 by 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 election winners by a close margin 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 the national assembly (MNAs) who defeated non-dynastic candidates by a close margin with that of non-dynastic MNAs who defeated dynastic candidates by a similar close margin by 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. In other words, 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 RDD 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 the outcome (local economic development) in dynast MNAs' constituencies, in which the dynast MNAs defeated non-dynast candidates with a narrow margin of close to zero, and non-dynast MNAs' constituencies, in which the non-dynast MNAS defeated dynast candidates with a similar margin.

Our empirical RDD specification is given as follows:

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

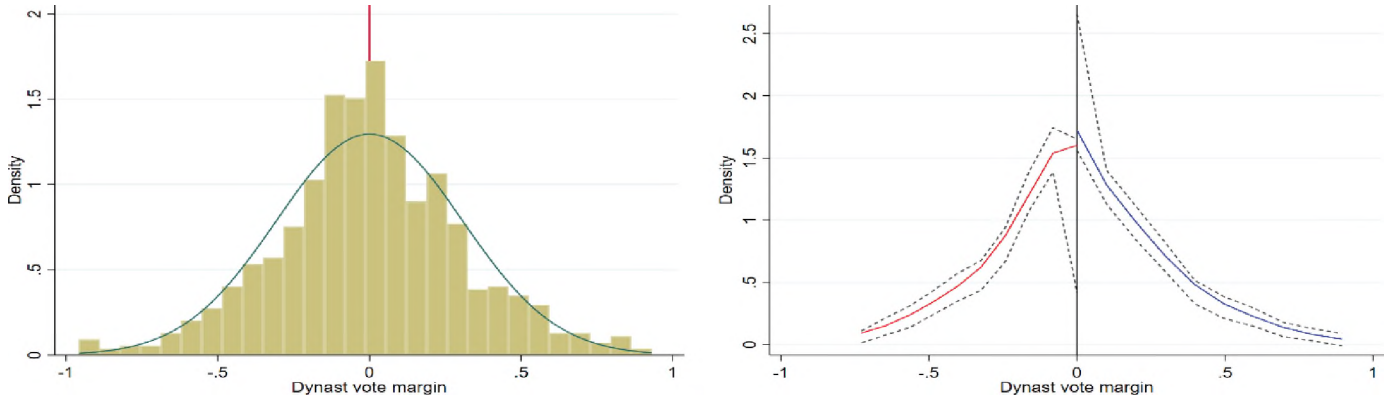
In Equation (1) Y_{ct} represents local economic development at the constituency level c at time t (2002-2013), $Dynast_{ct}$ takes the value of 1 if the elected MNA is from a dynasty and zero otherwise during the period 2002 to 2013, $Victory\ Margin_{ct}$ shows the margin of victory of a dynast over a non-dynast and vice versa, X_{ct} represents 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 is 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's vote margin at the cut-off, while Panel B (Figure 9) provides a 95% confidence interval around the distribution of the dynast's vote margin.[15]

The other concern with the validity of the RDD is the discontinuity in control variables at the cut-off line. If the 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 the dynast- and non-dynast-ruled constituencies between 2002 and 2013. It reveals that except for the nightlight mean, there is no statistically significant difference among other covariates.

Figure 9: Density of the Daynst Politician's Vote Margin (i.e., Forcing Variable)



[15] To detect discontinuity in the running variable (dynast's vote margin) around the threshold value of zero, we also performed Cattaneo et al. (2018) test. Its t-value (0.43) and p-value (0.67) did not reject continuity at the cut-off, i.e, no systematic electoral manipulation by dynasts were 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 Independent Candidates	0.08	0.11	-0.029
			[0.020]

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

6. RESULTS AND DISCUSSION

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

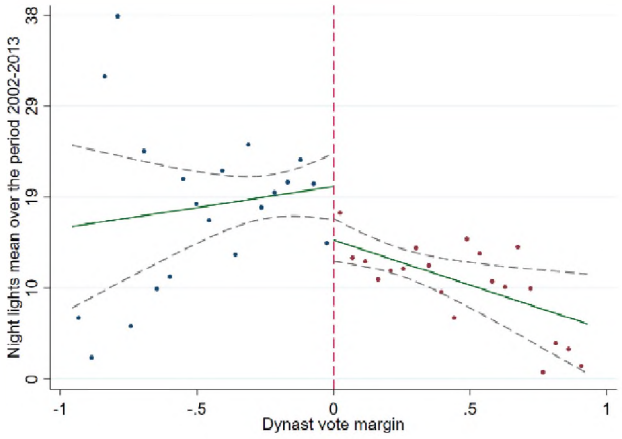
Graphical Evidence of Discontinuities

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 visualises 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., the 0 line, represent the margin of victory of the dynastic candidate over the non-dynast runner-up, and on the left of the cut-off, a dynast narrowly lost to non-dynast.

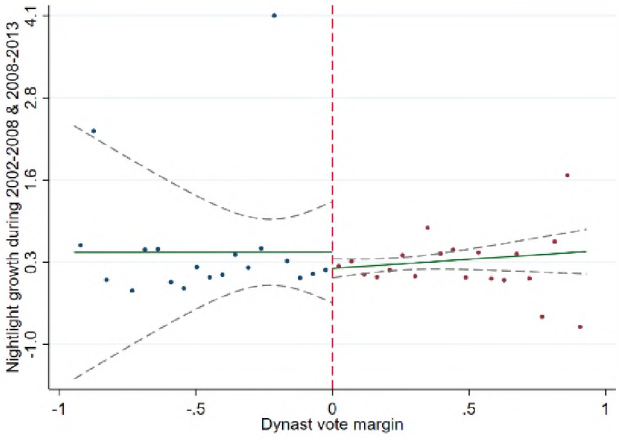
Figure 10 provides a clear discontinuity in both mean (Panel A) and growth (Panel B) in nightlight luminosity on locations on either side of the cut-off line. Specifically, locations on the right of the cut-off have lower mean and growth in nightlight relative to locations on the left of the cut-off. Similarly, Figure 11 visualizes discontinuities in the mean and growth of nightlights 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.

Figure 10: Nightlight Luminosity and Dynast Vote Margin at the National Level



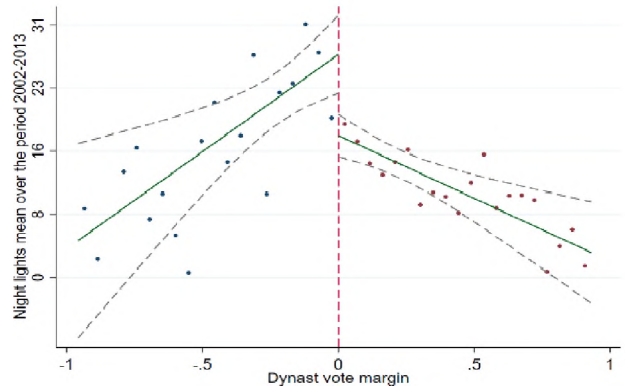
Panel A: Mean of Nightlight

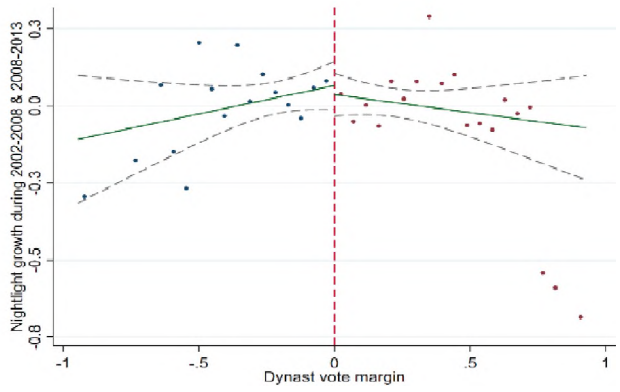


Panel B: Growth of Nightlight

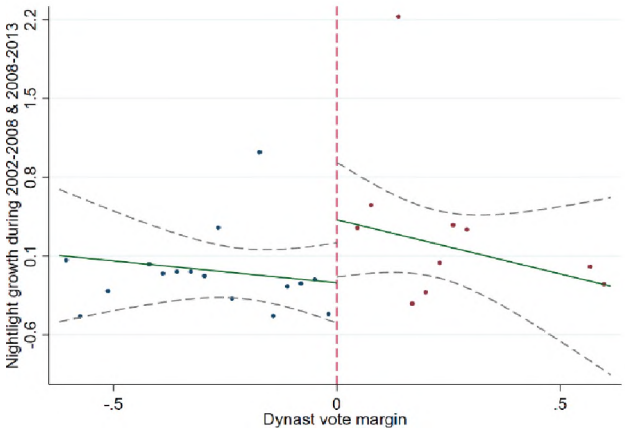
Figure 11: Nightlight Luminosity and Dynast's Vote Margin at the Provincial Level

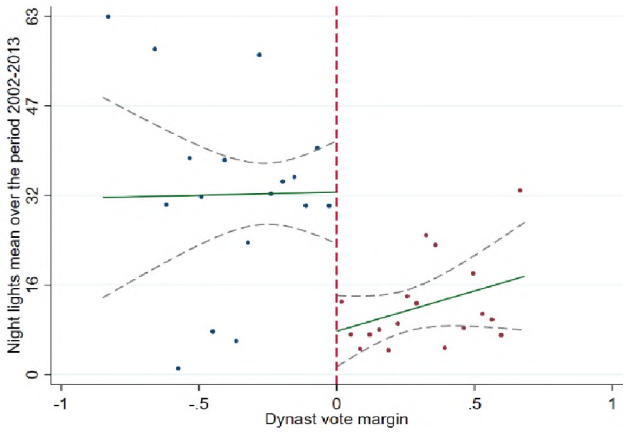
Panel A: Punjab



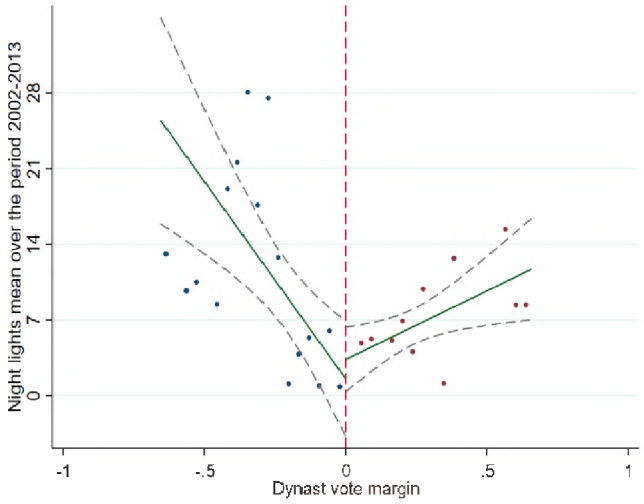


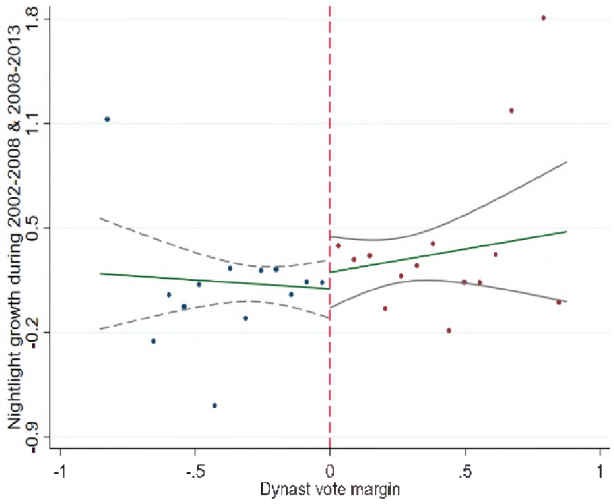
Panel B: Sindh



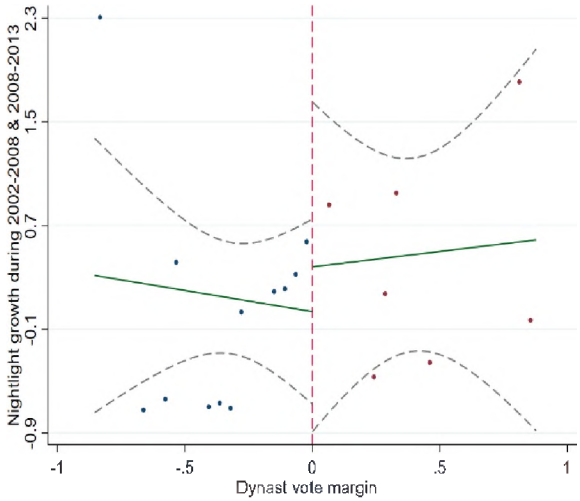


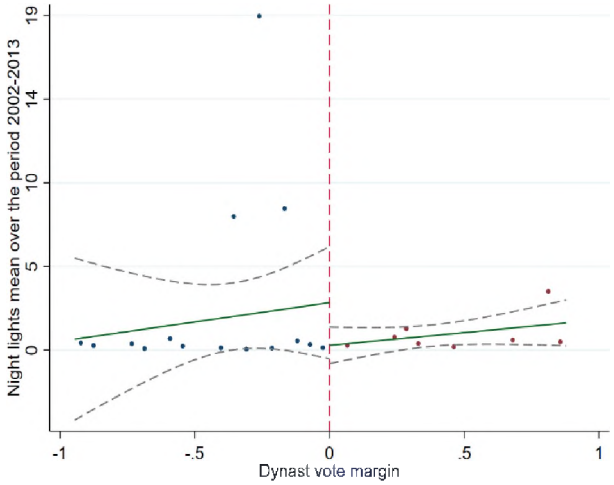
Panel C: Khyber Pakhtunkhwa





Panel D: Baluchistan





Regression Discontinuity Estimates

Table 5 presents results from the constituency-level RDD. All the regression specifications included district and time-fixed effects. The district fixed effects controlled for unobserved district-level factors that affect local economic development. Similarly, time-fixed effects controlled for time shocks that affect development in all constituencies over time. The regression specifications also included constituency-level and candidate-specific characteristics, such as turnout, ruling party legislator, voter share of the incumbent candidate, the number of independent candidates, the age of the candidate, and the number of terms a candidate won an election. Furthermore, we also performed regression analyses for different RDD 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 were won/lost by a dynastic politician by a margin of 3%, 5%, and 7%, respectively. The effect size of the coefficients is almost the same in these bandwidths. However, the statistical significance decreases for a bandwidth of 3%.

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 D G Khan, Haripur, Lakimarwat, Tando Allahyar, Tharparkar, Quetta and Loralai.

Similarly, Table 6 provides the estimates of the effect of a dynastic ruler on nightlight growth at the provincial level. Khyber Pakhtunkhwa and Balochistan 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 the nightlight growth in Jhang (77th nightlight percentile distribution) and Bahawalpur (50th percentile). Similar estimates are observed for 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 5: Effect of Dynastic Legislator on Nighttime Luminosity Growth at the 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 Bandwidth	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 presents the estimates of the specification in Equation (1). The dependent variable Y_ct is growth in nightlight luminosity during the electoral cycle in which a candidate was 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, the 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 the Provincial Level

	Punjab	Sindh	KPK	Balochistan
Dynastic Legislator	-0.295**	-0.251*	--	--
	(0.148)	(0.135)	--	--
			--	--
Bandwidth	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 presents the estimates of 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, the 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

Robustness

As discussed in the previous sections, 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 ones. Similarly, landholding 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 not only provides the actual effect of dynastic politics on economic development but also tests the validity of the nightlight as a proxy for economic and human development.

For this purpose, we utilised 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 matched 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 of 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 had a significantly negative effect on 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 per cent of the infrastructure index. Similarly, villages under a dynastic ruler have 25% fewer 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 of 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 centres, 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 regressed individual variables in the infrastructure index, i.e., household access to public services, such as electricity, flush latrine, drainage system, and piped water on having dynastic legislature in the constituency. The results are reported in Table 8 which reveal 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 validates the results obtained based on nightlight luminosity.

Table 8: Dynastic Legislator and Household Level Public Services

	Electricity	Flush Latrine	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 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 centres, 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 estimated 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 among effects 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 centres, 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 investigated 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% lower consumption than in 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 centres, 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

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 by casting votes in an election, political awareness, and support for democratic processes. The 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 favour 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 were 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 Behaviour

	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 such as know the name of 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 centres, 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-dynast 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, and 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 dynasts have 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 in less effort, which results in underperformance. Moreover, a 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 a 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 of 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 institutionalized 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 of the comparison of economic performances between dynast and non-dynast politicians. This should generate 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.

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

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OBFUSCATED LIBERALIZATION: HOW SPECIAL INTEREST GROUPS CAPTURE TRADE POLICY IN PAKISTAN

Adeel Malik and William Duncan

ABSTRACT

Trade liberalization gathered pace in 1990s as many developing countries signed international agreements that committed them to reduce tariffs. In trying to meet such tariff commitments, these countries usually resorted to alternative trade barriers that made trade policy complex and less transparent. Given that complex economic policies are likely to tilt the level playing field in favour of vested interests (Zingales 2017), we probe whether such "obfuscated" liberalization disproportionately favoured politically powerful special interest groups (SIGs). To investigate this, we compiled a granular product-level database on the presence of SIGs identified along a spectrum of political influence in the 119 manufacturing sub-sectors of Pakistan during the period, 1996-2021. Our difference-in-differences (DID) regression analysis leverages the change in political leadership in 2013 that brought a pro-business political party to power, which signed an IMF programme that committed it to simplify tariffs and remove policy exemptions. We show that, in the wake of the 2013 IMF programme, sectors with prior political exposure witnessed a comparatively higher increase in discretionary import duties and non-tariff measures relative to politically unexposed sectors. Estimating a structural model of trade protection (Grossman and Helpman 1994), we show that the presence of SIGs and politically connected actors were important predictors of overall trade protection, especially during the period when trade policy became more complex.

1. INTRODUCTION

After several decades of trade openness and liberalization, contemporary economic discourse in advanced economies is increasingly debating the discontents of hyper-globalization (Rodrik, 2022). However, the important question for many developing countries is not whether globalization might have gone too far. Rather, the challenge is often their insufficient and reluctant integration with global economy. As developing countries faced a growing external impulse to liberalize their economies in the late 1990s, many sought to do so begrudgingly. Overwhelmingly focused on reducing average tariffs, trade liberalization in such cases was often shallow, leaving considerable scope for affording comparative higher tariff protection to sectors deemed strategically important. A key feature of such partial liberalization was the ability to substitute declining tariffs with other trade policy instruments, which maintained overall levels of trade protection and rendered trade policy non-transparent and complex. Such complexity tends to favour privileged or connected actors (Zingales, 2017).

Despite this being the norm in developing countries, we have a limited understanding of the political logic undergirding such trade policy substitution. As Kono (2006) argued, replacing tariffs with less transparent trade policy instruments can be politically optimal in a competitive democratic context. This is because obscure and complex trade policy instruments (e.g. non-tariff measures) might be less costly in political terms as: (a) they are more difficult to difficult to explain to voters; and (b) they can be justified as advancing consumer welfare by pursuing health, safety and environmental considerations. However, in poor developing countries that are either fragile democracies or ruled by autocratic regimes, voter preferences are an arguably less salient feature of trade policy formation. Instead, pandering to special interest groups (SIGs) and the co-option of elite business actors via trade policy forms an important strategy for political survival in such contexts.

In this paper, we highlight this political economy of trade policy by providing a rich empirical illustration from Pakistan that witnessed a period of "obfuscated" liberalization whereby tariff reductions were followed by a stream of non-transparent and discretionary trade policy instruments that effectively made trade policy more complex or obfuscated. We show that such complexity or obfuscation primarily favoured politically powerful businesses by affording them disproportionately higher levels of protection. To demonstrate this, we compiled a highly granular product-level database on the presence of politically connected actors in 119 manufacturing sub-sectors of Pakistan. Our political connections dataset maps information on the presence of trade associations, parliamentarians and their business interests, and politically entrenched business families in Pakistan. We utilize this data in an empirical strategy that leverages two key developments in 2013: firstly, a change in political leadership in 2013 that brought to power a political party traditionally known for its proximity to powerful business actors; and secondly, an IMF programme that included a broad package of reforms, including trade reform. This was an externally driven attempt aimed at the simplification of tariff rates, removal of non-tariff barriers, and phasing out of trade policy exemptions.

While seeking to comply with these requirements the government resorted to an alternative set of trade policy instruments in the guise of regulatory duties (RDs) and non-tariff measures (NTMs). Some of these instruments, such as RDs, were effectively emergency measures that only required cabinet approval rather than a parliamentary consent. Combining these elements in a difference-in-differences (DID) regression framework, we show that sectors with prior exposure to political powerful businesses disproportionately benefited from higher regulatory duties after 2013 relative to politically unexposed sectors (and to the pre-2013 period). We also leverage the 2013 trade policy shock to examine the differential evolution of the intensity of NTM protection across politically exposed and unexposed sectors. In the wake of the 2013 shock, there was a dramatic increase in the application of non-tariff measures that affected almost the entire manufacturing product space. While in 2012 less than 10 percent of total products in the manufacturing sector were covered by NTMs, the ratio increased to 80 percent in 2013. Our DID regression analysis suggests that sectors exposed to special interest groups represented by strong business lobbies or politically connected firms were able to secure higher intensity of non-tariff protection in the wake of the 2013 trade policy shock.

We address the standard empirical concerns that apply to DID regressions. The main identification assumption is that both treatment and control groups should be independent of potential outcomes. In this regard, one concern is the self-selection of politically connected actors into sectors that are likely to receive greater trade protection

after 2013. Our sectoral measure of political exposure is defined in a way that captures actors who are either sufficiently entrenched—and entered far back in time—or unlikely to have anticipated the IMF programme and its requirement to implement trade reform. We also provide evidence on the parallel trends assumption. Specifically, we show that the trajectories of our trade protection measures did not differ significantly between politically exposed and unexposed sectors in the pre-shock period. We also recognize that some sectors may be especially pre-disposed to higher trade protection than others. We account for such time-invariant sector-specific characteristics by controlling for ISIC-4 level sector fixed effects. It is also possible that there are some time-varying sectoral characteristics that are correlated with a sector's political exposure and determine the potential for future trade protection. Although we cannot rule out all possible dimensions, we are at least able to include in our regression models the interactions of important sectoral characteristics (e.g. prior levels of trade protection, import dependence, number of establishments, etc.,) with the full set of year fixed effects. To the extent that there might be broad sectoral trends in the evolution of trade protection over time that might conflate with our results, we also test the robustness of our findings to the inclusion of industry-specific time trends.

As a final step in our analysis, we take a broader empirical sweep on the political economy determinants of overall trade protection by estimating the structural model of trade protection that accounts for government-industry interaction (Grossman and Helpman, 1994). There is a vast literature on endogenous tariff formation that has empirically affirmed the theoretical predictions of the "Protection for Sale" type models using industry-level data from the United States (Goldberg, et al., 1999, Gawande and Bandyopadhyay, 2000), Turkey (Mitra, et al., 2002; Limao and Tovar, 2011) and India (Bown and Tovar, 2011). We contribute to this literature in three ways. Firstly, we expand the empirical focus of such estimations by including, besides tariffs and non-tariff measures, other ad-hoc trade policy instruments (i.e. regulatory duties and additional customs duties). In this regard, our work is closest in spirit to Bown and Tovar (2011) who have shown how exceptional non-tariff measures, such as anti-dumping and safeguarding measures, substituted for tariff reductions in politically organized sectors in the wake of 1990-91 IMF agreement. Secondly, another important departure from prior work is that we utilize a more direct proxy of politically connected sectors that is based on fine-grained information on political connections. By contrast, previous studies have used relatively indirect proxies for sectoral exposure to special interest groups measured using the number of groups listed in important reference works, such as the World Guide to Trade Associations. Thirdly, we offer a slight empirical innovation by using the synthetic control method to construct the main instruments for IV estimation of the Grossman-Helpman model. Our results affirm that the presence of SIGs and politically connected actors are an important determinant of the equilibrium level of trade protection in Pakistan. As expected, the SIG effect really kicks in during the post-2008 period, and amplifies in particular after 2013, when trade policy was obfuscated through the introduction of ad-hoc and less transparent instruments of protection. Our results also reveal a curious empirical pattern that points to a reversal of trade liberalization during the two decades that form part of our study period. Thanks to declining tariffs, overall trade protection registered a steep decline since 2001. However, the introduction of alternative trade instruments compensated for this fall in tariffs in the following two decades, restoring overall trade protection to the same level as in 2001.

Our paper contributes to a slim literature on the politics of trade policy substitution that has sought to establish how tariff reductions in many developing countries were counteracted by the rise of alternative instruments of trade protection that sought to redistribute privileges towards SIGs and politically connected actors (Bown and Tovar, 2011; Eibl and Malik, 2016; Ruckteschler, Malik and Eibl, 2022). While past studies have mainly focused on tariffs and non- tariff measures, we expand the focus to include ad-hoc import duties. Typically introduced to deal with current account challenges by curtailing imports, these emergency duties can also serve a revenue generation purpose. Globally, the use of trade policy for revenue generation has fallen in prominence. Currently, only about 2.3 percent of total revenues are raised, on average, through trade taxes. However, in 2021 the corresponding ratio still hovered around 12 percent in Pakistan. May poor countries with an undiversified tax base still derive 10-41 percent of their total revenues through taxes on international trade.[1] While their ostensible purpose might be revenue generation and/or import compression, the possibility that such import duties might privilege SIGs and contribute to overall trade protection, together with tariffs and NTMs, is not fully appreciated.

[1] The average for least developed countries (UN Classification) is 10%. The proportion of total revenues raised through trade taxes is as high as 41.2% in Benin, 32.4 % in Gambia, and 18% in Philippines. The ratio remains high even after accounting for taxes natural resource intensity of countries. World Bank (2022a).

Our work also feeds into a well-established literature on the political economy of economic reform (Krueger, 2002; Roland, 2002), especially a selected sub-strand on the politics of trade liberalization (Milner, 1999; Baccini, 2019). Amongst other dimensions, this sub-strand has studied the role of international institutions and agreements (e.g. WTO, PTAs, EU, IMF, etc.) in tying the hands of local rulers vis-à-vis their domestic protectionist lobbies (who are also politically influential in political terms)—see Maggi and Rodriguez-Clare (2007) and Baccini (2019) for a gist of this argument. However, this still leaves open the possibility of incomplete or partial liberalization which, rather than credibly constraining the rulers, affords them the opportunity to pick and choose from the liberalization menu in ways that is politically more palatable. One such possibility would exist, for example, when governments are able to substitute one type of trade barrier with another. Such trade policy substitution can allow rulers to compensate politically connected actors for the loss of tariff protection. In fact, rulers can extend such actors even greater protection than was available in the pre-liberalization period, thereby generating additional rents for politically influential constituencies.

These dynamics are more likely to play out when the overwhelming focus of externally- induced attempts at trade liberalization is on tariff reductions. Indeed, many of the preferential trade agreements that developing countries signed in the decades of 1990s and 2000s only committed them to reduce tariffs, leaving considerable scope for manipulation of trade policy. We have evidence from at least three contexts---India (Bown and Tovar, 2011), Egypt (Eibl and Malik, 2016), and Morocco (Ruckteschler, Eibl and Malik, 2022)---that tariff commitments were followed by introduction of less transparent trade instruments that disproportionately favoured politically exposed sectors. This paper complements this slim literature by furnishing a concrete empirical illustration from Pakistan.[2]

By showing how trade liberalization can be used to redistribute economic privileges to connected firms, our work directly responds to Atken and Khandelwal (2020)'s call for more research on the "subject of how political connections … distort the gains from trade reforms in the developing world" (p. 231).[3] This is an important question from the perspective of developing countries where rents generated through trade policy manipulation might be deemed crucial for political survival, following a logic similar to Bueno de Mesquita et al., (2003). While prior work in this regard has been mainly conducted in the context of explaining variation in the political economy of trade between between democracies and autocracies (Zissimos, 2017), and within autocracies (Galiani and Torrens, 2014; Baccini and Chow, 2018). Our focus on Pakistan enriches this literature by furnishing evidence from an institutional context where competitive lobbying and authoritarian power sharing are both important. The literature typically describes such political order as a hybrid regime where the transition from authoritarianism to democracy is incomplete, and superficial attributes of democracy are combined with authoritarian power structures (Blaydes, 2008; Levitsky and Way, 2010). While we know little about any distinctive aspects for trade policy formation in hybrid regimes, firms in hybrid regimes express greater dissatisfaction with policy uncertainty than established autocracies and democracies (Kenyon and Naoj, 2009). In this context, we expect entrenched business actors with long-standing ties with leadership of political parties and the military are likely to enjoy greater leverage in influencing economic policy than parliamentarians alone. The different indicators of political influence we construct for our empirical analysis accounts for such dynamics. In doing so, we especially take heed of Atken and Khandelwal (2020) who advocate combining "multiple sources and types of data" as a "particularly fruitful" area of progress (p. 233).

The remainder of this article is structured as follow. Section 2 provides a brief background on trade policy dynamics in Pakistan. Section 3 precisely describes the data and its sources. In section 4, we investigate the role of SIGs in shaping the post-2013 trajectory of import duties and NTMs. In section 5 we estimate a structural model of overall trade protection, and conclude in section 6.

2. BACKGROUND: TRADE POLICY IN PAKISTAN

In this section, we offer salient features of Pakistan's trade policy. Pakistan lags behind in global trade integration. Equivalent to around 30 percent of GDP, the country's global trade is relatively modest. It also faces a major export

[2] Our work makes a definitive contribution in this regard as the trade literature on Pakistan is both empirically unsophisticated and has largely ignored the political economy dimension.

[3] Baccini, Pinto, and Weymouth (2017) establish distributional consequences of PTAs by firm-level, and show how the gains are unevenly distributed among firms.

challenge. Its exports are mainly concentrated in low value-added segments of garments and textiles. As a ratio of GDP, Pakistan's exports have declined from 16 percent in 1999 to 9.98 in 2021. The country has experienced large and persistent current account deficits. These dismal economic patterns are partly linked with Pakistan's overall trade policy stance that can be described as protectionist and relatively inward oriented. It is designed without a clear industrial policy framework and has sometimes been geared towards revenue generation. Judged on various metrics, the country stands out as one of the most protectionist economies in the world relative to its income, size, and geography. For example, Pakistan ranks highly on the overall trade restrictiveness index, which captures the trade policy stance and ensuing distortions that each country imposes on its import bundle.[4]

Consistent with the broader trend in developing countries, Pakistan began to liberalize its economy in the 1990s when the processes of deregulation, privatization, and tariff liberalization got underway. Pakistan became a member of the World Trade Organization (WTO) in 1995. Trade liberalization began in earnest in late 1990s, and gathered pace in early 2000s. According to Wacziarg and Welch (2003), "uninterrupted liberalization" began in Pakistan in 2001. This was manifested in a dramatic reduction of average tariff rates across industries. While the average tariff rate on imports was 54.73 percent during the period 1990- 99, it reduced to around 30 percent in 2001. Tariff rates have witnessed a steady decline since then, currently hovering around 10-12 percent since 2019.

Despite this apparently sharp decline in tariffs, Pakistan continues to be characterized as a highly protected economy. This is attributable to the highly selective and partial approach to trade liberalization reflected in several factors. First, while tariff rates have fallen on average, there is significant tariff dispersion among products and sectors. For example, while the average tariff rate is 12 percent, the corresponding rate for consumer goods is 35.4 percent, which is the second highest after Egypt (57.7 percent) and exceeds by a wide margin from Bangladesh (19.9 percent)—see World Bank (2021, p. 23). Among other factors, such high levels of tariff dispersion could reflect complexity of tariff codes (World Bank, 2020). Second, the fall in tariffs has been compensated by other instruments of trade protection, including different types of import duties and non-tariff measures (henceforth, NTMs). Import duties were first introduced in 2008, sharply increased in 2013, and registered a modest rise again in 2016. These duties mainly appeared in the guise of regulatory duties (RDs) and additional customs duties (ACDs). A key distinction between tariffs (or customs duties) and other import duties is that, while the former require a parliamentary approval, the latter only need approval from the federal cabinet. The first wave of import duties in 2008 were preceded by a current account deficit that necessitated import compression to curtail the deficit. An unspoken, yet important objective was revenue generation. The most prominent wave of import duties kicked in 2013. A further increase was registered in 2016.

Import duties are typically imposed through Statutory Regulatory Orders (SROs), an infamous executive device to grant exceptions and exemptions to specific products and sectors. Most of the tariff lines in Pakistan remain vulnerable to an SRO application (Pursell, Khan and Gulzar, 2011). This renders import duties more discretionary, ad-hoc, and subject to political abuse. Overall, as World Bank (2021) notes, high and increasing import duties place Pakistan in the top decile of the global distribution of average import duties across countries (p. 23). Besides import duties, another important trade policy development has been the introduction of non- tariff measures (NTMs). As Figure 1 shows, the year 2013 marked a watershed year in this regard given the huge wave of NTMs introduced in that year.

The 2013 wave of NTMs was immediately preceded by an IMF agreement. While primarily aimed at dealing with country's weak balance of payments position and achieving macroeconomic stabilization, it included a broad package of reforms including trade-related measures.[5] While structural reforms do not traditionally fall in the remit of IMF, the Extended Fund Facility in 2013 placed special emphasis on energy and trade reforms to "boost long- term growth potential".[6] Closely coordinated with the World Bank, the trade conditionality insisted on a simplification of tariff slabs and the removal of trade-related statutory regulatory orders (SROs). As per the IMF Agreement: "The authorities will prepare a three-year program to return to a simplified import tariff regime, with

[4] World Bank (2022a).

[5] A few months later, in January 2014, Pakistan also joined the European Union's GSP+ scheme that provides tariff preferences for imports into the EU from developing countries. The GSP+ scheme affords preferential accesses to Pakistani exports to EU at zero duties for 66% of the tariff lines.

[6] I am grateful to Mansoor Dailami, former IMF Representative to Pakistan, for providing further clarity on this. IMF 2022.

four tariff rates ranging from 0-25 percent with few exemptions" (IMF, 2013, p.35). Besides simplifying tariffs, the programme required that Pakistani government at the time would eliminate "statutory regulatory orders (SROs) that establish special rates and/or nontariff trade barriers in some 4,000 product areas" (p. 79). As the government sought to comply with these IMF requirements in 2013, it resorted to a stream of alternative trade measures including regulatory duties and NTMs. Of all the NTMs historically introduced in Pakistan, slightly less than half (17 out of 42) were slapped during 2013 and 2014. An even more salient feature of the NTM shock in 2013 was the dramatic increase in NTM coverage of products. In fact, of all the products covered by NTMs since 1967, about two-thirds of this NTM coverage was extended during the period, 2013-15 (Aleem and Faizi, 2021). This sharp increase in the NTM coverage of products hints at a growing intensity of NTM protection. In our empirical analysis, we will probe whether the wave of regulatory duties and the growing NTM intensity might have afforded disproportionately higher levels of protection to politically powerful sectors. While admittedly the NTMs lack a clear protectionist intent (unlike non-tariff barriers), they can practically serve as trade frictions given the variation in enforcement regime. Figure 2 summarizes Pakistan's major trade policy developments which we will subsequently harness in our empirical analysis.

To summarize, Pakistan embarked on tariff liberalization in 2001 that resulted in a steep tariff reduction. However, this tariff liberalization was counteracted by a trade policy stance that became growingly complex and non-transparent over time. Piggybacking on severe current account deficits, which necessitated import compression and resort to IMF programmes, successive governments in Pakistan have increased their reliance on other instruments of trade protection such as import duties and NTMs. Some of these instruments, such as regulatory duties and additional customs duties, are essentially blunt instruments giving governments considerable leeway for discretionary and arbitrary decision making. We are interested in probing whether such trade policy complexity was more susceptible to capture by vested interest groups.

There has been a long-standing debate in Pakistan on the concentration of economic power among a handful of families. The country's former finance minister, Mahbub ul Haq famously referred to the economic stranglehold maintained by 22 families who, in his words, "had pre- empted most investment permits, import licenses, foreign credits and government patronage because they controlled or influenced most of the decision-making forums handing out such permissions" (quote from Haque and Hussain 2021). In his book, Industrial Concentration and Economic Power in Pakistan, Lawrence White identified 43 families who controlled the heights of the economy (White 1974). Recently, Haque and Hussain (2021) identified 31 influential families who dominated the Karachi Stock Exchange. The companies owned by such powerful form part of powerful business networks that allow them to tap into several privileges. The value of business networks is demonstrated by Khwaja, Mian and Qamar (2008) who compiled information on over 100,000 firms and constructed a network of firms using inter-locking board memberships. The top 5% of these firms had access to two-thirds of total credit. In related work, Khwaja and Mian (2005) showed that politically connected firms in Pakistan borrow 45 percent more than unconnected firms and have 50 percent higher default rates. Such politicized lending took place mainly through the state-owned banks.

3. DATA AND DESCRIPTIVES

In this section, we describe the main data components of our empirical analysis and their underlying sources. Our analysis leverages highly fine-grained datasets on tariffs, non-tariff measures (NTMs), import duties (RDs), political connected firms, and industry-level characteristics. While the first three types of data are compiled at a more granular HS-6 product level, the latter two are compiled at ISIC-4 level manufacturing sub-classification. We describe these data inputs in greater detail below.

Tariffs and Non-tariff Measures

The data on tariffs and non-tariff measures (NTMs) at the six-digit product level comes from the WITS and UNTRAINS database. Data is available for the period 2001-2018. Apart from providing HS-6 level data on tariffs, the database offers highly granular data on the presence, entry, and type of NTMs. We thus have information on when NTMs were introduced, when they were repealed (if at all), and what types these NTMs were. This rich dataset is based on a new structured system of classification that divides NTMs into 16 different chapters and

assigns them to two main categories, technical and non-technical measures (the third category consists of export-related measures). Some of the main NTM categories include the following: Technical Barriers to Trade (TBT), Sanitary and Phytosanitary Measures (SPS), Pre-shipment Inspection (PSI), and Price Control Measures (PCMs). The detailed NTM classification is outlined in the Appendix. This rich data on NTMs is aggregated at the ISIC-4 level manufacturing sectors. Using this data, we construct a measure of NTM intensity, defined as the share of products covered by at least three NTMs in an ISIC-4 level sub-sector.

Import Duties and Other Trade Datasets

We also leverage a novel dataset on import duties in Pakistan compiled by World Bank (2020). The dataset is at the HS-6 product level and covers the period, 2008-2021. The underlying data is based on detailed information from Pakistan's Ministry of Commerce, including the regulations and legal codes associated with SROs (Statutory Regulatory Orders). Import duties are separated coded as regulatory duties (RDs) and additional customs duties (ACDs). Our estimations of the Grossman-Helpmanm model require two additional data inputs: ad-valorem equivalents (AVEs) of non-tariff measures and import demand elasticities. We obtain the AVE estimates at the HS-6 product-level comes from Niu et al. (2018). The data is available from the Nottingham Centre for Research on Globalisation and Economic Policy (GEP) website (nottingham.ac.uk/gep/index.aspx). For product-level data on import demand elasticities, we use the estimates computed by Ghodsi, Gruber, and Stehrer (2016). Finally, data on ISIC-4 sector-level characteristics, such as number of firms, number of employees, and value-added comes from various waves of Pakistan's Census of Manufacturing Industries (CMI). We also construct an overall measure of protection combines the data on tariffs, AVEs of NTMs, regulatory duties, and additional customs duties. This measure provides a fuller picture of the effective trade protection and will be utilized in our estimations of the Grossman-Helpmann model of trade protection.

Connected Firms

We compiled a novel dataset on the presence of special interest groups (SIGs) and politically connected firms in ISIC-4 manufacturing sub-sectors in Pakistan. To this end, we draw on a variety of primary and secondary data sources that capture the presence of actors and interest groups across a wide spectrum. Starting with a most generic and widely used measure of influence of SIGs in the trade literature, we code the presence of business associations at the ISIC-4 level. Following the convention in trade literature, we generate a dummy variable for "organized" sectors that equals one if there is at least one business association serving in the manufacturing sub-sector. The coding is based on information available in the World Guide to Trade Associations. We do recognize, however, that all business associations may not possess the same lobbying power. An illustrative example in the Pakistani context is the disproportionate influence wielded by the All Pakistan Textile Mills Association (APTMA) and Pakistan Sugar Mills Association (PSMA) relative to other lesser known organizations. Such differences are unlikely to be captured by a simple binary measure.

Our next category of influence is a measure that captures the presence of the powerful business families controlling some of Pakistan's leading business conglomerates. Their names and the companies they owned were documented by an investigative journalist Shahid-ur-Rehman in a report entitled, Who Owns Pakistan, published in 1998 (Rahman 1998). These prominent business groups have historically enjoyed political influence and lobbying power under both military and civilian regimes. Importantly, as Rehman (1998) argued, these business families were important beneficiaries of the privatization and de-regulation reforms carried out by Mohammad Nawaz Sharif's government in 1991. The privatization process in 1990s was tainted with allegations of corruption and cronyism (Rahman, 1998).[7] Many of these business families were also adept at using their political influence to obtain loans from government-owned banks in 1990s and to get politically motivated debt write-offs (Khwaja and Mian, 2005). These politically powerful families have also been important claimants to the lucrative exemptions received through SROs and the various guises of import licenses. We use information on these families and their companies to construct a variable named Powerful Families that equals one when a family is active in an ISIC-4 sub-sector.

Our final measure captures direct political influence by identifying firms whose owners have held an elected political office. Using the standard convention in the literature, especially the seminar work by Faccio (2006), we

[7] This was affirmed by a report of the public accounts committee in 2002.

classify a firm as politically connected if one of its top shareholders is (a) a member of parliament and (b) a minister or the head of state. To this end, we compiled detailed data on parliamentarians' assets and incomes that all MNAs (Members of National Assembly) are required to declare by law and made available by Free and Fair Election Network (FAFEN). Specifically, we use this information for the 2002, 2008, and 2013 election rounds. After identifying the parliamentarian-linked firms, we classify the products these companies produce and assign them to their relevant ISIC-4 sub-sectors. The indicator variable politically connected then picks out the manufacturing sub-sectors where at least one parliamentarian-linked firm has been operating. Finally, we also create an overlapping category of influence defined as politically organized that picks out ISIC-4 sub-sectors that meet all three conditions, in the sense of being served by a business organization and populated by a powerful business family and at least one parliamentarian. All our measures are binary, classifying whether or not a sub-sector is penetrated by an influential actor. In future extensions of this paper, we will also experiment with measures of the extent of crony penetration (i.e. treatment intensity).

Descriptive Statistics

The evolution of tariffs and non-tariff measures since the late 1990s, highlights two key patterns: (a) there is a substantial reduction in average applied tariffs since 1998. Since the late 1990s (b) there is a dramatic surge of NTMs in the year 2013 (see Figure 2). Our dataset on regulatory duties also indicates three main temporal junctures. The duties are first introduced in 2008 and substantively raised in 2013. In 2016 there was a further increase in regulatory duties. Our data also indicates significant dispersion in these trade measures across products and sectors. Both tariffs and import duties as well as the NTMs vary significantly across sectors. For example, while the average regulatory duty for our sample period is 3%, it ranges between 0 and 62 percent. Practically, this can translate into high rates of effective protection for favoured sectors. We will exploit such variation in our analysis.

Table 1 lists the 22 sectors broadly defined as per the 2-digit ISIC codes. We also report, next to each broad sectoral classification, the total number of ISIC-4 level manufacturing sub- sectors. There are 119 such sub-sectors that form part of our empirical analysis. In Table 2 we report the summary statistics of our various measures of political influence. Each column reports the share of ISIC-4 sub-sectors exposed to the relevant actor with political influence. As Table 2 reveals, there is considerable variation in sectoral exposure to special interest groups and crony actors. For example, some sectors such as manufacturing of transport equipment (code: 32) and office and computing machinery (code: 30) are not represented by any business association, others such as manufacture of tobacco products (code: 16) and textiles (code: 17) remain considerably well-represented through business associations. Similar variation is evident in the sectoral exposure to powerful families and parliamentarians. While in some cases only 40 percent of the ISIC-4 sub-sectors had a powerful family operating in them, others had 100 percent exposure. In terms of direct political connections, some sectors had zero presence of parliamentarians while sectors such as textiles, paper, rubber, and food products had a significant political exposure.

4. REGULATING PRIVILEGE: SPECIAL INTEREST GROUPS, IMPORT DUTIES, AND NTMS

In this section, we investigate whether the stream of regulatory duties and non-tariff measures (NTMs) introduced after 2013 disproportionately favoured sectors dominated by special interest groups (SIGs), as proxied by various measures of political influence. As noted in section 2, regulatory duties were first introduced in 2008 but witnessed a major spike in 2013.

The same year saw a massive wave of NTM measures that affected almost all sectors (see Figure 1). These significant developments in trade policy were preceded by the formation of a new government under the Prime Ministership of Nawaz Sharif, the head of PML(N) party under whose previous stint in government (1990-1993) a major privatization effort got under way. As a pro-business party with deep ties to the big wigs of industry, the SIGs had ready access to economic decision making. Soon after assuming power, the PML(N) government signed an IMF programme whose major thrust was on trade reform. As argued in section 2, the IMF programme in 2013 required the government to simplify trade policy through (a) the elimination of exemptions and exceptions in trade policy by streamlining the SROs and (b) the removal of non-tariff barriers (note these are different from

NTMs). In the face of this externally driven attempt to simplify trade policy and the need to comply with IMF requirements, a new significant wave of emergency trade measures was unleased in the guise of regulatory duties. The same year, a raft of non-tariff measures was introduced that affected the entire universe of manufacturing sub-sectors.

To investigate whether sectors exposed to SIGs were more likely to have benefited from the respective waves of regulatory duties and NTM protection in the wake of the 2013 shock, we estimate the following difference-in-differences regression specification:

$$TP_{it} = \alpha + \beta * DID_{it} + \gamma_j X_i \, x \, Year_t + \delta_t + \tau_t + \varepsilon_{it} \quad (1)$$

where i is ISIC-4 level sub-sector, t is time.

TPit is the relevant measure of trade policy, i.e. average regulatory duty in the relevant ISIC-4 level manufacturing sub-sector or the *NTM intensityit* is defined as the proportion of products in ISIC-4 level manufacturing sub-sectors that are covered by at least three NTMs.

DIDit is the difference-in-differences interaction term between treatment variable and a Post2013 indicator variable. In regressions of regulatory duty, we firstly probe the impact of Powerful Families defined as a dummy variable that picks out sectors that were exposed to families mentioned in Rehman (1998). We also show results for other categories of political influence, such as an indicator variable capturing the presence of SIGs and parliamentarians. In regressions of NTM intensity, we deploy a more general measure of political influence as captured by a dummy variable Politically Organized that is equal to one for sectors that meet the following three conditions: they are organized, politically connected and controlled by powerful families. The Post2013 indicator is equal to one for the post 2013 period (i.e., 2013- 2018). β is our coefficient of interest that captures the differential effect of regulatory duties or NTMs for sectors exposed to political influence (compared to sectors without political influence) after the 2013 shock (relative to the pre-shock period). *Xi* is a matrix of control variables that can potentially shape both the post-2013 trajectory of regulatory duties or NTM intensity and correlated with the sector's exposure to SIGs. For example, prior level of trade protection could determine which sectors end up having greater exposure to regulatory duties or NTMs. To ensure this, we control for pre-period average (2001-2012) of MFN tariffs interacted with the full set of year fixed effects. Similarly, we account for a sector's import dependence and other industry characteristics. Our empirical specification includes the ISIC- 4 level sector fixed effects (δt) and year fixed effects (τt). $\mathcal{E}it$ is the error term. The sample consists of 119 ISIC-4 level manufacturing sub-sectors, unless otherwise specified, and the period of estimation is 2006-2021. Observations are at the sector-year level, and cover 16 years of data for 119 ISIC-4 sub-sectors.

We recognize possible identification concerns and try to address these in our empirical strategy. We treat the 2013 shock as a relatively exogenous event that was triggered by an externally driven trade policy harmonization process that coincided with the signing of the IMF agreement. Politically influential actors were not the principal driving force behind the trade policy reconfiguration that resulted in the 2013 shock. However, once the shock hit all the manufacturing sub-sectors, these actors were well-positioned to take advantage of it. An important identification assumption pertains to the existence of parallel trends in the pre- shock period between treatment and control groups. Figures 3-5 offer some pertinent evidence in this regard. Figure 3 charts the evolution of regulatory duties across different categories of political influence, and shows that while sectors with powerful business families tended to have slightly higher regulatory duties before 2013, they were on the same trend as sectors in the control group. However, after 2013 the difference in regulatory duties between the two groups widens sharply and persists over time. The same pattern is evident expand the category of political influence to include both members of powerful business families and presence of business associations (Figure 4) or use a more intensive overlapping category of influence that picks out sectors with presence of powerful families, business associations, and parliamentarians (Figure 5). As expected, politically organized sectors seem to have disproportionately benefited from the 2013 wave of regulatory duties.

It is important to verify that there are no compositional confounding factors in the treated and non-treated groups. For example, there might be unobserved sectoral differences that are correlated with both a sector being

characterized as politically influential and receiving a greater trade policy shock. To address this, we include sector and time fixed effects. The former account for time invariant sectoral characteristics that may be correlated with either or both the treatment and outcome variables. Year fixed effects control for time-specific shocks that affect all sectors in a given year. For further robustness, we include broad sectoral trends by interacting 2-digit ISIC sector fixed effects with time dummy variables. The inclusion of these account for the fact that some sectors might be susceptible over time to a differential trend in regulatory duties and NTM intensity. Finally, we also account for important sector-specific characteristics, such as prior level of tariff protection, import dependence, and other relevant controls described above. Each of these controls is interacted with the full set of year fixed effects.

Import Duties

Table 3 presents the results of our DID set-up in equation (1), using powerful families identified by Rehman (1998) as the measure of influence. The dependent variable is the average import duty (non-tariff) in percent, defined as the sum of regulatory duty (RD) and additional customs duty (ACD). The first column presents results for a simple specification that only includes the DID interaction term, and sector and year fixed effects. As expected, our coefficient of interest on the DID interaction term turns up as positive and statistically significant at 1 percent level. This is consistent with our prior, and the visual pattern reported in Figure 3. Sectors historically exposed to powerful families received a significantly higher trade protection in the guise of (non-tariff) import duties after 2013. In columns 2-6, we probe the robustness of this pattern by successively adding our main controls, some of which are averaged over the pre-period and interacted with a full set of year fixed effects. To this end, we first add the average MFN tariff rate to ensure that our results are not unduly influenced by pre-existing differences in tariff protection (see column 2). In column 3, we add the ad valorem equivalents of non-tariff measures (AVEs) interacted with the full set of year fixed effects. Next, in columns 4-6, we control for industry-level characteristics (measured at the ISIC-4 level). These include, respectively, the imports to GDP ratio, total number of establishments, and value-added. As the results show, our coefficient of interest remains positive and statistically significant at 1 percent level. The coefficient remains highly stable across specifications. These patterns survive the inclusion of industry-specific time trends measured at the ISIC-2 level. This suggests that the significantly higher exposure of sectors with powerful families to import duties after 2013 (relative to sectors without exposure to such families) remains a robust feature of the data and cannot be easily attributed to a common set of confounders controlled in these regressions.

In Table 4 we replicate this exercise for a more expansive measure of SIGs that picks out the presence of both powerful families and business associations. The presence of either actor turns on the indicator to 1 (o, otherwise). The results are instructive. As before, the coefficient on the DID interaction term remains positive, stable, and highly significant at 1 percent level across all columns. Importantly, the magnitude of the SIG effect is now higher (as reflected in the larger coefficient). In Table 5 we further expand our category of political influence by including the presence of parliamentarian-linked firms in an ISIC-4 sector. To be precise, we define a dummy variable that is equal to one for a sub-sector that is exposed to either of the three: a powerful family, business association, or a parliamentarian. This category defines a sector as politically organized in an inclusive sense. As the reported coefficients in Table 5 reveal, the SIG effect is not only highly statistically significant but is even stronger when compared with the magnitudes of DID coefficients in Tables 3 and 4. Together, these results offer a highly consistent empirical pattern indicating how sectors exposed to special interest groups prior to 2013 ended up receiving higher import protection in the guise of import duties in the aftermath of the 2013 shock to trade policy.

Intensity of NTM Protection

We next examine the role of SIGs in explaining differential sector-level exposure to non-tariff measures after 2013. Our focus on NTMs is guided by the fact that multilateral trade liberalization has led to a generalized decline in tariff barriers and the removal of non-tariff barriers (such as quotas and restrictions with an obvious protectionist intent). This has, however, been followed by the emergence of non-tariff measures, commonly known as NTMs, as the dominant form of trade protection. As applied tariffs have fallen by 66% in low and middle-income countries since 1996, the non-tariff measures have increasingly substituted for tariffs as the

dominant vehicle for trade protection. This is reflected in the fact that NTMs contribute more than 70% to global trade protection today (Kee, et al., 2006). However, unlike tariff barriers, the NTMs are not easily quantifiable as they usually consist of complicated legal texts that defy a simple characterization. UNCTAD (2010) defines NTMs as "policy measures, other than ordinary customs tariffs, that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both" (UNCTAD, 2010). The NTMs are essentially "complicated legal texts" that are applied for specific products and applying countries.

The NTMs differ in an important respect from what were previously described as non-tariff barriers (or NTBs). The principal difference is that, unlike NTBs, non-tariff measures can be introduced to facilitate and harmonize trade through procedural regulations. For example, sanitary or phytosanitary measures can be applied for health and safety considerations. Similarly, NTMs can reflect the technical properties of individual products or can be part of wider efforts by developing countries to harmonize regulations with trading partners. Some NTMs are intended to meet specific European Union standards (this is true for some SPS and TBT measures). Other technical measures can be imposed for environmental considerations that have gained salience over the last two decades due to popular concerns around environmental and climate issues. Thus, at least in principle, the NTMs can be imposed for achieving desirable regulatory standards and with the intention of facilitating trade. However, in practice, the impact of NTMs is determined in large part by the type of NTM imposed and how they are implemented. As WTO (2012) argues: "the effects of NTMs are dependent not only on regulatory frameworks but also on their implementation procedures and administrative mechanisms".

As recent work has shown, there can be a sharp disjunction between regulatory intent and practice (Hallward-Dreimeir and Pritchett, 2015). When implementation is inconsistent and enforcement is selective, the same regulations can become more burdensome for some firms than others. Thus, regardless of their intent and despite their being based on otherwise legitimate considerations (e.g. environmental, health and safety concerns), NTMs can ultimately serve as a form of trade protection that draws a wedge between domestic and foreign prices of products. Emerging work on non-tariff measures has shown that developing country firms need to spend significant resources to comply with NTMs. Even the apparently harmless harmonization standards can prove costly for domestic firms in third markets (Cadot, Disdier and Fontagne, 2012). There is growing evidence that NTMs can have a profound impact on trade performance. In majority of developing countries today NTMs are twice as restrictive to trade than tariffs and contribute more overall trade restrictiveness (Kee, et al., 2006). NTMs have also shown to be more costly than tariffs, especially in developing countries. NTMs can also adversely affect exports (World Bank, 2019).

Importantly, the disjunction between de jure intent and de facto implementation creates a room for selective enforcement. Implementation of NTMs requires administrative oversight, which is notoriously susceptible to political abuse. Selective enforcement can create a domain of privilege that can effectively favour more powerful and connected firms. The cost of compliance can systematically differ across firms depending on their proximity to political power. NTMs can be effectively used to generate rents for protected sectors and firms. Thus, both in terms of incidence and intensity, NTMs can be governed by a similar logic of the political economy of rent seeking, where rents induced by trade policy strengthen vested interest groups who might lobby for greater trade protection to secure and maintain these rents. In this context, recent empirical work on Morocco, Egypt, and Tunisia has demonstrated the capture of NTMs by politically connected firms in the wake of tariff reductions and the substitution of tariffs with non-tariff measures (Kruse, et al., 2021; Ruckteschler, et al., 2021; and Eibl and Malik, 2016).

Given the recent dominance of NTMs, the institutional and political determinants of NTMs are not well-understood. In this sub-section, we investigate whether the presence of different types of organized and connected firms in a sector might be correlated with greater burden of NTM protection. To do so, we leverage the sectoral differences in exposure to NTMs over time and ask whether politically connected sectors have witnessed a differential exposure to NTMs relative to unconnected sectors. Our analysis leverages the massive wave of NTM introductions in 2013 that affected most sectors in the manufacturing space. Our interest lies in probing whether connected sectors have witnessed a disproportionately higher intensity of NTM exposure in the wake of the 2013 wave. To do so, we leverage the two fine-grained databases on political connections and NTM exposure described in section 3.

Exploratory Evidence

To motivate our empirical analysis, we chart the evolution of NTM exposure. As Figure 1 shows, the year 2013 saw a large wave of NTM introductions. While only less than 10 percent of products in the 119 manufacturing sub-sectors were covered by NTMs in 2012, the ratio jumped to 80 percent in 2013. This was a universal shock of sorts that affected all products and sectors. However, there is considerable cross-sectoral variation in the application of NTMs. This means that, for some sectors, the NTM shock in 2013 might have been more pronounced than others. Our interest is in exploring whether the evolution of NTMs differed across sectors depending on their political weight. Our main prior is that sectors with more politically influential firms might have disproportionately benefited from higher trade protection in the guise of non-tariff measures. We examine this using three categories of political influence defined in section 3: sectors represented by formal business associations, sectors with politically connected actors, and sectors controlled by powerful families.

The initial patterns are instructive. Figures 6-8 chart the evolution of cumulative number of NTMs across different categories of influence. In each case, we see a visible jump in the cumulative number of NTMs in 2013. In Figures 9-11, we plot our preferred measure of NTM intensity, defined as the share of products covered by at least three NTMs. Again, we notice a clear divergence emerging in the trajectories of NTM intensity between different categories of political influence. This pattern is also confirmed in Figure 12, which presents a plot for our preferred overlapping category of political influence, defined as "politically organized" sectors. These are effectively sectors that meet all three criteria, that is: they are represented by a business association, have politically connected actors, and controlled by at least one of the members of powerful families, as defined in Rahman (1998). As Figure 12 reveals, the share of products covered by at least three NTMs now jumps to roughly 75 percent for politically organized sectors, and the difference between connected and unconnected sectors appears even more substantial. Apart from the slight uptick in 2003, there are no discernible differences in the trajectories of our measure of NTM intensity in the pre-period between politically organized and unorganized sectors. Our empirical analysis will examine if these otherwise noticeably different trajectories of NTM intensity for politically organized and unorganized sectors hold up to a more robust econometric scrutiny.

Difference-in-differences Analysis

Table 6 presents the DID results for our core empirical specification set out in equation (1). The dependent variable is a measure of NTM intensity, defined as the proportion of products in an ISIC-4 sub-sector that are covered by at least three NTMs. We begin in column 1 by running a simple variant of our specification that only includes the DID interaction term and controls for both sector and year fixed effects. As expected, the interaction between the treatment dummy, which identifies whether or not a sector is politically organized, and a post-2013 indicator variable has a positive and statistically significant coefficient. In columns 2-7, we successively add the interactions of our main control variables with the full set of year fixed effects. To account for the possibility that sectors with higher levels of prior tariff protection might have witnessed a greater increase in NTM intensity post 2013, we include the interaction of average pre-period MFN rate with year fixed effects. Since higher import dependence might induce greater NTM exposure, we add in column 3 the import to GDP ratio. Similarly, we progressively add the total number of establishments and value added (as a share of GDP) in columns 4-5. The inclusion of these variables is motivated by the fact that sectors employing a larger number of workers and with a higher value added might entail a different structure of trade protection.

Given the complex array of trade policy instruments in use in Pakistan, it is possible that sectors that are subjected to these alternative instruments might have witnessed a differential trajectory of NTMs. In this regard, column 6 accounts for average regulatory duty, which emerged as an important instrument of trade protection in 2008. Finally, in column 7, we include the interaction of average import elasticity of demand with year fixed effects. Again, the underlying logic is similar: sectors with greater import elasticity might see a differential evolution of NTMs. Reassuringly, as the results in columns 2-7 show, the inclusion of these potential confounding factors does not drive away our main finding. The coefficient on the DID interaction term remains stable, positive, and statistically significant across all specifications. In column 8 we subject our results to a more stringent test by including ISIC-2 level industry- specific time trends. While the coefficient of interest falls slightly in magnitude, it remains statistically significant at 3 per cent level. Finally, we present the results for a two-period DID model in

While the greater intensity of NTM protection after 2013 seems to have overwhelmingly benefited sectors with prior exposure to politically connected actors we do not find a similarly robust empirical pattern for measures of NTM incidence. In fact, none of our measures of political influence appear as significant drivers of the post-2013 trajectory of NTM incidence. Specifically, we obtain a null result when regressing the number of new NTM introductions or the cumulative number of NTMs on the DID interaction term. Overall, our results suggest that the SIGs had a more pronounced impact on NTM intensity rather than NTM incidence. This is consistent with the manner in which NTMs have evolved in Pakistan. In this regard, a key feature of the post-2013 salience of NTMs is mainly defined by an increasing coverage of products by new or existing NTMs rather than just new NTM introductions (Aleem and Faizi, 2021)—also see discussion section 2. In terms of specific NTM types, technical measures were the most prevalent form of NTMs applied to manufacturing products (see Appendix A for NTM classification).

To further concretize these results, we draw on a granular database on ad valorem equivalents (AVEs), compiled by Niu et al. (2018), and investigate whether politically organized sectors benefited from higher protection in terms of tariff equivalents during the 2013-18 period. Expressing NTMs in terms of their tariff equivalents (AVEs), it appears that despite the declining tariff levels overall protection might have actually increased in Pakistan. In the manufacturing sector, the AVEs increased, on average, from 0.44 in 2006 to 55.80 in 2015 (Aleem and Faizi, 2021). To probe whether the AVEs increased disproportionately more in politically organized sectors, we run a regression of ISIC-4 level AVEs on the dummy for politically organized sectors. We control for sector characteristics (import elasticity, import to GDP ratio, MFN tariffs, value added, etc.), ISIC-2 level fixed effects, and year fixed effects. Despite conditioning on these factors, we find that the AVEs were significantly higher for politically organized sectors in the post-2013 period. Figure 13 provides a visual representation of this by plotting the average residual AVEs for politically organized and unorganized sectors. As the figure shows, conditional on different sectoral characteristics, average AVEs were positive and higher for politically organized sectors than politically unorganized sectors in the post-2013 period.

5. ESTIMATION OF GROSSMAN-HELPMAN MODEL

In the foregoing analysis we have shown that tariff liberalization since the early 2000s has been followed by the introduction of alternative instruments of trade policy, namely import duties and non-tariff measures. We have established that these instruments extended disproportionately higher levels of protection to politically exposed sectors than sectors where such political influence was lacking. In this section, we extend our discussion beyond individual instruments of trade policy and analyse the evolution of overall trade protection. To this end, we construct a measure of effective trade protection that combines the four main trade policy instruments, including MFN tariffs, AVEs of NTMs, regulatory duties, and additional customs duties. We then estimate a structural model of trade protection by Grossman and Helpman (1994) that endogenizes trade protection by theorizing the interaction between special interest groups and government. The Grossman and Helpman model (henceforth, G-H model) offers testable predictions and is the most widely used framework in the political economy of trade policy.

Estimation of G-H Model

We estimate the structural model of trade protection proposed by Grossman and Helpman (1994) to determine equilibrium trade protection across 119 manufacturing sub-sectors in Pakistan. The G-H model proposes a structural equation that utilizes information on political power of respective industries to predict the equilibrium level of tariffs in that industry. The model has been extended by a spate of recent work, including Mitra et al. (2002) and Bown and Tovar (2011), which complements the original focus on tariffs with non-tariff measures. In investigating the political determinants of the structure of trade protection, we further expand the focus to include import duties besides tariffs and non- tariff measures. We believe that taking account of these discretionary and exceptional measures is important for studying the evolution of overall trade protection.

The model assumes a numeraire good produced solely by labour; every other good uses a combination of labour and specific factors in its production. Owners of specific factors are able to organize into a lobby and provide contributions to elected officials. This results in a vector of choices by the government which may exhibit

differential trade policy based on political influence. Consistent with prior literature, we measure political power of a sector by number of trade associations. We complement this with a more direct measure of political influence to define sectors that are "politically organized". We define this as an intensive overlapping category of influence that picks out manufacturing sub-sectors that are not only served by a business association (i.e. organized) but also exposed to at least one parliamentarian and a powerful family as defined in Rahman (1998).

The G-H model predicts equilibrium tariff levels based on structural factors in each sector. We expect that tariff levels have moved away from the predicted equilibrium and that by accounting for the overall level of protection in each sector, trade policy has moved toward the equilibrium predicted by the model. We will construct an overall measure of protection by combining tariffs (MFN rates), ad-valorem equivalents for NTMs (Mitra, et al., 2002; Bown and Tovar, 2011), and import duties (RDs and ACDs). Our use of regulatory and additional customs duties is an innovation in the literature. The structural model is expressed as follows:

$$\frac{t_i}{1+t_i} = \frac{1}{a+\alpha_L}\left[I_i * \left(\frac{z_i}{e_i}\right)\right] - \frac{\alpha_L}{a+\alpha_L}\left[\frac{z_i}{e_i}\right] \qquad (2)$$

Where *ti* is the effective measure of protection which includes, depending on the individual specification, MFN tariffs, AVEs of NTMs, and import duties. Import duties consist of regulatory duties and additional customs duties. *zi* is the ratio of domestic output to imports or exports (depending on whether the sector is import competing or an exporting one); *ei* is the absolute value of price elasticity of import demand or export supply; *Ii* is an indicator variable that takes a value 1 if the sector is organized or politically connected; and αL is the proportion of the country's workforce that is employed in sectors that are organized or politically connected. From the regression coefficients, we can obtain values for a. This gives us an estimate about the weight that the government places on social welfare compared with the weight placed on political contributions. Given the structural equation, and the variables included, the estimation equation becomes:

$$\tau_{i,t} = \beta_0 + \beta_1 \left(I_i \times \frac{z_i}{e_i}\right)_t + \beta_2 \left(\frac{z_i}{e_i}\right)_t + u_{i,t} \qquad (3)$$

The output of interest from these empirical estimations is β1 which indicates whether, holding a sector's size and elasticity constant, political influence leads to systematically higher levels of protection. Additionally, using the empirical results, we can back out the parameters in the structural model to obtain estimates for α, the share of the workforce in sectors that are organized and/or politically influential, and a, the relative weight policymakers place on social welfare over political contributions.

Instruments

This model cannot be accurately estimated with OLS because we have potentially endogenous variables entering nonlinearly on the right-hand side of the equation, which include the output to import ratio, the price elasticity of import demand, and the indicator for politically organized sectors. Following a common practice in the literature, we address these endogeneity concerns we use a Tobit estimation procedure combining the empirical approaches in Smith and Blundell (1986) and the Kelejian (1971). The methodology requires that we use least squares to regress the right-hand-side endogenous variables and their nonlinear transformations on the instruments and then include the residuals from these regressions as additional variables in the original import protection equation. The instruments can include the exogenous variables, as well as their quadratic terms and cross-products.

The instruments consist primarily of variables capturing industry characteristics. In this regard, our choice is motivated by previous tests of the model on other countries and trade policy settings. The variables used to instrument for the political organization variable include the number of employees by establishment, the number of establishments per sector, value added per firm (a measure of scale), and the level of output for a given sector. Typically, import demand elasticity is instrumented using a weighted average of countries that are similar to the country in question. For example, Bown and Tovar instrument India's import demand elasticities using the elasticities for five other "similar" countries that are not India's main trade partners (Malaysia, Philippines, Thailand, Tunisia and Indonesia). However, in prior work similarity is often determined on an ad-hoc basis. We

decide to take a systematic approach and develop the elasticity instrument using the synthetic control algorithm (Abadie and Garbeazabal, 2003; Abadie, et al., 2010; Abadie, et al., 2014).

Synthetic Sector Characteristics

In order to improve the quality of the sector-level characteristics used to instrument for the political connection variables, we construct synthetic values for the number of employees by establishment, number of establishments per sector, value added per firm (a measure of scale), and the level of output for a given sector. The method used is based on the literature which has developed this robust approach (Abadie and Garbeazabal, 2003; Abadie, et al., 2010; Abadie, et al., 2014) and is described in detail in the Appendix B. Data on sector characteristics in Pakistan comes from the Census of Manufacturing Industries (CMI) which is collected by the Pakistan Bureau of Statistics. This data is collected in survey waves and relevant to the period of our study are CMI data collected in 1995-1996, 2000-2001, 2005-2006.

The synthetic data is constructed by sector. We use United Nations Industrial Development Organization (UNIDO) INDSTAT ISIC Rev. 3 data at the sector level from 2005 to 2016 for all countries available (58 countries and politically distinct regions). We use 2005 through 2007 as the pre-period, 2008 as the treatment period, and 2009 through 2016 as the post-period. The treated unit is Pakistan using the CMI sector-level industry data and the donor units are the 58 countries and politically distinct regions from the sector-level INDSTAT data. This procedure creates a synthetic value added, establishments per sector, employees per establishment, and output per sector. We need these instruments for our full sample period from 1996 - 2018. In order to obtain synthetic variables for value added, establishments per sector, employees per establishment, and output per sector we obtain out-of-sample prediction. Using synthetic variables constructed for the period, 2009-2016, we compute sector-level trends and predict values for 1996-2008 as well as 2017 and 2018.

Data on the price elasticity of import demand comes from Ghodsi, Grubler, and Stehrer (2016) who have estimated elasticities for 167 countries (including Pakistan). Estimates for unilateral import demand elasticities are available for the period, 1996-2014, and differentiated by product and country. We aggregate these product-level estimates to the sector level by taking a weighted average. However, one limitation of the Ghodsi et al.'s estimates is that they are only available for an extended cross-section of countries. This precludes us from using the synthetic control algorithm, which requires data for pre- and post-period. In order to systematically choose a weighted contribution of other countries to the synthetic price elasticity of demand for Pakistan that will instrument for the real price elasticity of demand, we therefore use principle component analysis (PCA) instead of the synthetic control method. We use the PCA algorithm to construct the Pakistani price elasticity of import demand as a linear combination of other countries' price elasticities of import demand. Once this linear combination is created, we have our feature vector of possible principal components and we use a screeplot to choose the top principal components that will be used to obtain predicted Pakistani import price elasticities (see Appendix C for further details). Once these principal components are chosen, we regress the real Pakistani import price elasticities on these principal components, the feature vector, and then use the resulting empirical model to predict Pakistani import price elasticities. These predicted import price elasticities, averaged by sector, are used as instruments in the G-H model.

Evolution of Overall Trade Protection

We first visually inspect the evolution of our overall measure of trade protection across different categories of political influence. We present patterns for both the long horizon (1996-2021) and the short horizon (2005-2021). Overall protection is defined as the sum of the following four key trade policy instruments deployed over the last two decades: tariffs, AVEs of NTMs, regulatory duties (RDs), and additional customs duties (ACDs). Figure 14 provides a visual description of the trend across a conventional measure of political influence: whether a manufacturing sub-sector is organized. As Figure 14 reveals, overall levels trade protection for organized and unorganized sectors tracked each other closely till the year 2013. However, after 2013 the protection levels for organized sectors took over that of unorganized sectors, and have consistently remained higher since then. This pattern is further highlighted as we zoom in by focusing on the short horizon (see Figure 15). These plots also reveal another crucial pattern. Pakistan witnessed two major episodes of tariff liberalization over the last two

decades. Tariffs were first liberalized in late 1990s. They were slashed further in 2001. However, as trade policy substitution kicked in through the introduction of other instruments, overall levels of trade protection began to rise in 2013 and returned to almost the same level as in 2001. This suggests a reversal of trade liberalization.

Next, in Figures 16-17, we repeat the same exercise for a broader category of political influence that combines information on the presence of both business associations and powerful families in a sector. Categorizing such sectors as being exposed to special interest groups (i.e. SIGs), Figures 16-17 show an even larger divergence since 2013 in levels of trade protection between politically exposed and unexposed sectors. The presence of SIGs appears to be an important force behind the reversal of trade liberalization. In fact, at the end of our sample period in 2021 the overall level of trade protection in sectors exposed to SIGs ended up being higher than in 2001. This suggests that politically exposed sectors were not only compensated for the fall in tariffs but were also afforded disproportionately higher overall trade protection.

Finally, Figures 18-19 provide a visual representation of these patterns for a measure that captures the intensity of a sector's political exposure through three overlapping categories: interest representation through a business association and the presence of at least one powerful family and a parliamentarian. The differential evolution of overall trade protection for politically organized sectors compared to politically unorganized sectors appears even more pronounced. The divergence becomes sharper after 2013 and persists over time. Taken together, Figures 18-19 reveal a consistent pattern whereby overall trade protection began to diverge in 2013 between politically exposed and unexposed sectors. Since tariffs were generally declining over the period, this is mainly attributable to the introduction of alternative instruments of trade protection, such as ad-hoc import duties and non-tariff measures. As a result, nearly two decades after trade liberalization gathered further steam under General Musharraf in 2001, overall trade protection reverted back to the same level in 2021. In fact, politically exposed sectors ended up securing even higher levels of import protection than what was available to them two decades ago in 2001. These patterns foreground our estimations of the G-H model below.

Estimates for G-H Model

Tables 7-10 provide the results for the augmented structural model of trade protection by Grossman and Helpman (1994). Estimations of the G-H model yield two main coefficients. Firstly, the coefficient on the interaction of our measure of political influence of SIGs and the import penetration ratio divided by the absolute value of the price elasticity of import demand. The other is the coefficient on the import penetration ratio divided by the absolute value of the price elasticity of import demand. From these coefficients, we can back out the parameters that are included in the structural model. For our purposes, we are mainly interested in the coefficient on the interaction term with our indicator of political influence. This will estimate, holding sector size and elasticity constant, the impact of a sector's political power on the overall level of protection that a sector receives.

Guided by Pakistan's recent trade policy developments, we split our empirical analysis into three distinct time periods. The first time period includes observations for the years from 1996 to 2007; the second time period includes observations for the period, 2008-2012; the third time period includes observations for the period, 2012-2021. We start in column 1 by restricting the focus to MFN tariff rates. In columns 2-4, we successively include additional measures of trade protection, such as AVEs of NTMs (col. 2), regulatory duties (col. 3), and additional customs duties (col. 4). Each specification includes sector and year fixed effects. Results are presented in Tables 7-10. Table 7 reports the OLS results for the G-H model using the indicator for organized sector. As the results show, our coefficient of interest on the main interaction term is statistically significant for both tariffs and the expanded measures of trade protection for the pre-2008 period in columns 1-4. The G-H model thus helps to explain the equilibrium value of protection during the period, 1996-2007. However, the corresponding coefficients for the other two periods (2008-12; post-2012) remain statistically insignificant.

Given the endogeneity concerns described earlier, we proceed to our preferred IV specifications in Table 8. The results reveal a slightly different pattern here. The coefficients on the interaction term for the pre-2008 period are now statistically insignificant across all columns. However, they regain their statistical significance for the two period slabs after 2008. Coefficients remain consistently positive and statistically significant at 10 percent level. Note that the magnitudes of coefficients in the post-2008 period are significantly higher compared to the

pre-2008 estimates. There is also an incremental increase in magnitudes of the coefficients in periods 2 (2008-2012) and 3 (post-2012). Overall, these patterns are consistent with the descriptive trends presented earlier that highlighted a growingly salient divergence in the trajectories of trade protection between politically exposed and unexposed sectors over time.

Next, in Table 9, we provide estimates for the G-H model using our alternative overlapping category of political influence. Deploying this measure of politically organized sectors in the interaction term, we obtain OLS estimates for the interaction term that are broadly consistent with the evidence we have presented so far. None of the coefficients on the interaction term are statistically significant during the pre-2008 period. However, they are consistently positive and significant at 1 percent level in the two specified time periods after 2008. The corresponding IV estimates, reported in Table 10, add a further nuance. Now, not only do the coefficients on the interaction term remain insignificant for the pre-2008 sample they are also uninformative in column 1 that exclusively focuses on tariffs. It is only in models with the expanded measure of trade protection (cols 2-4) that the interaction coefficients turn up as positive and statistically significant. As before, the magnitude of these coefficients becomes incrementally larger over time especially after 2012. Importantly, the IV coefficient estimates for the interaction term (Table 10) are noticeably larger than the corresponding OLS estimates (Table 9).

Overall, these results suggest that sectors exposed to special interest groups and politically connected actors are an important determinant of the equilibrium level of trade protection in Pakistan. This is particularly true for the period after 2008 when additional trade policy instruments gained more prominence in the face of relative decline in tariff rates. Our results are also consistent with evidence presented in earlier sections on how politically influential sectors witnessed a higher trade protection in the guise of NTMs and import duties.

6. CONCLUSION

We have offered novel empirical evidence in this paper on an important episode of partial liberalization in Pakistan where tariff reductions were substituted over time with alternative instruments of trade protection in the guise of non-tariff measures and import duties. These additional measures seem to have afforded disproportionately higher level of protection to sectors exposed to political influence. Our empirical analysis leveraged an IMF programme in Pakistan in 2013 that committed a new civilian government, which has been historically aligned with powerful business lobbies, to institute trade reform by simplifying tariffs and removing exemptions. Our DID results show that sectors penetrated by special interest groups and politically connected actors disproportionately benefited from these additional trade measures introduced after the 2013 IMF agreement. Constructing an expanded measure of trade protection, which includes both tariffs and additional trade policy instruments, we estimate an equilibrium model of trade protection by Grossman and Helpman (1994) and empirically affirm the political logic behind trade protection.

Our empirical analysis highlights that after having embarked on tariff liberalization in late 1990s, Pakistan witnessed a gradual reversal of liberalization in subsequent two decades. In fact, overall trade protection in 2021 effectively returned to the same level as it was at the beginning of 2001, the year when sustained tariff reductions began. This liberalization reversal is shaped by the introduction of NTMs and a set of ad-hoc import duties which, despite the falling tariff levels, restored overall trade protection to the same level as in 2001. Differentiating these patterns by exposure to political influence, we show that politically exposed sectors ended up receiving even higher trade protection than was available to them earlier in the liberalization period. This is consistent with emerging evidence from other developing countries where trade liberalization has similarly increased, not just preserved, rents for special interest groups (Diwan, et al., 2019; Ruckteschler, et al., 2021). One important reason behind this pattern is the growing complexity of trade policy. This is evident in Pakistan where falling tariff barriers have given way to a greater reliance on discretionary instruments of trade policy that masked effective trade protection by making trade policy more complex. Such complexity seems to have disproportionately benefited politically exposed sectors. This emphasis aligns well with an important observation made by Luigi Zingales in his article, "Political Theory of the Firm", where he argued that the increase in the "size and complexity of regulation" has made it "easier for vested interests to tilt the playing field" (Zingales, 2017).

Our analysis carries special policy relevance for developing countries struggling with the effects of partial liberalization. Pakistan is a particularly important cautionary tale in this regard. While trade policy became particularly complex and prone to political capture since Nawaz Sharif's return to political power in 2013, the differential protection afforded to connected sectors continued unabated when the PML(N)'s government was replaced with Imran Khan's PTI. Such policy continuity highlights the vested interest groups' continued access to levers of power. It is important to note that our empirical analysis only captures the lower bound of the overall protectionist stance of trade policy. There are other disguised aspects of trade protection reflected, for example, in sales taxes and federal excise duties that all importers are required to pay. The administrative procedures used to grant exemptions and subsidies to exporters add a further complication.

The capture of trade policy by politically powerful groups has profound consequences for Pakistan's development. The country has suffered from a recurring balance of payments (BOP) problem, which is partly rooted in the stagnation of its exports. Interestingly, both the BOP and export challenges have intensified since 2013, the same year when many of the emergency trade measures highlighted in this paper registered a noticeable spike. The import protection afforded to such interest groups entrenches the anti-export bias of Pakistan's trade policy, which is considered as a major drag on Pakistan' development (World Bank, 2021). There is an inherent relationship between higher import protection, stagnating exports, and current account imbalances. A protectionist trade policy that is based on ad-hoc political preferences rather than a carefully thought-out industrial policy tends to incentivize domestic production, privileging it over an outward orientation catering to export markets. Import duties can thus effectively serve as a tax on exports. While the NTMs can have more differentiated effects, their usage in Pakistan has been associated with an increase in export costs (World Bank 2019). The burden of NTM protection can be gauged from the fact that in the textile sector, which is the mainstay of Pakistan's exports, the AVEs of NTMs have increased from 0 percent in 2003 to 41 percent in 2015 (Aleem and Faizi, 2021).

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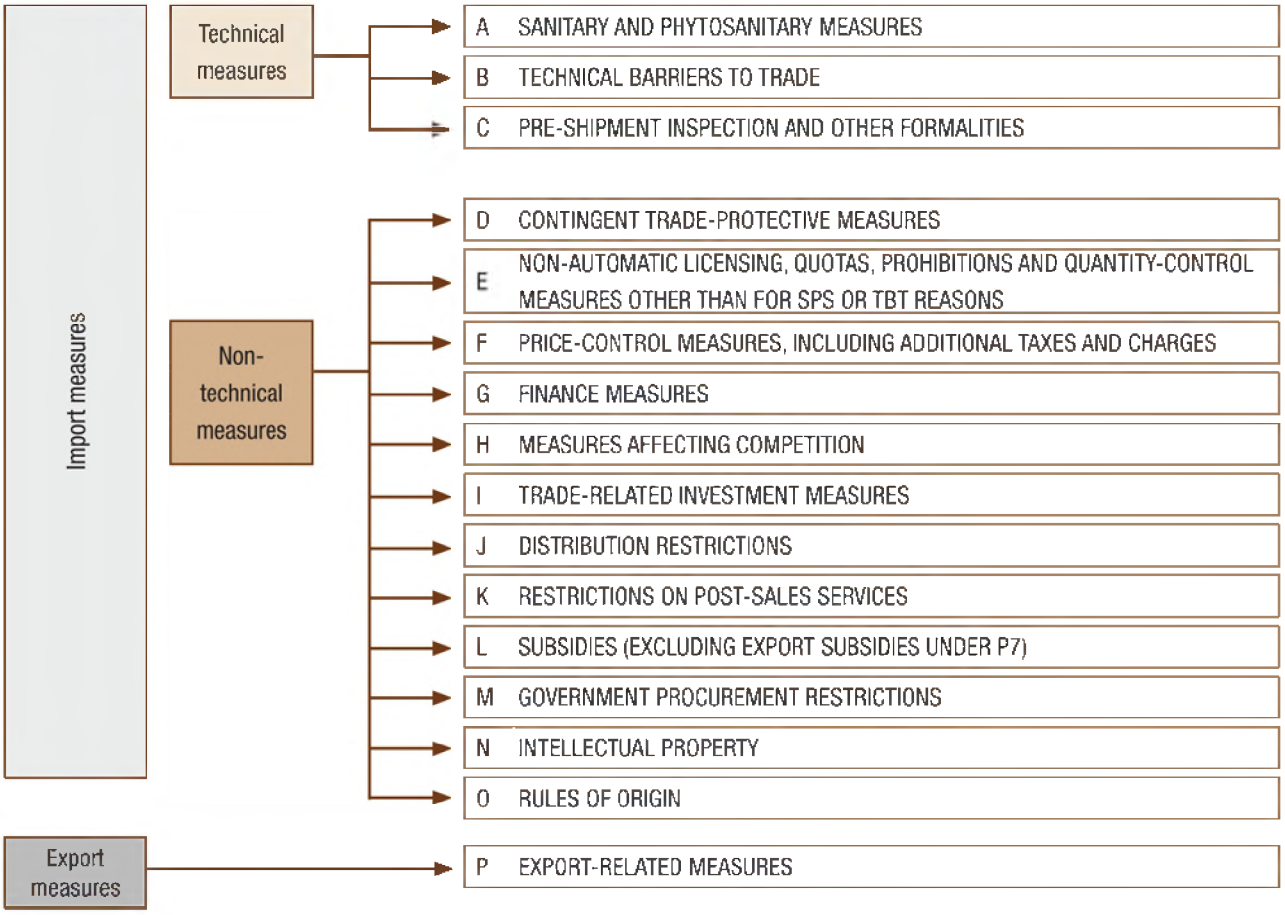
APPENDICES

Appendix A: NTM Classification



Appendix B: Construction of Synthetic Sector Characteristics

The difference between the pre-period characteristics of the treated unit and a synthetic control is given by the vector X_1 - X_0 W where X_1 is the synthetic price elasticities created for Pakistani manufacturing sectors and X_0 W are the matrix of price elasticities, X_0, from other countries multiplied by the weights, W, which comprise a synthetic Pakistan. We select the synthetic control, W∗, that minimizes the size of this difference. This can be operationalized in the following manner. For m = 1, ..., k, let X1m be the value of the mth variable for the treated unit (Pakistan) and let X0m be a 1 ×J vector containing the values of the mth variable for the units in the donor pool (all other countries in the dataset). Abadie and Gardeazabal (2003) and Abadie, Diamond, and Hainmueller (2010) choose W∗ as the value of W that minimizes:

$$\Sigma_{(m=1)}^{k} v_m (X_{1m}-X_{(0,m)} W)^2 \qquad (3)$$

where vm is a weight that reflects the relative importance that we assign to the mth variable when we measure the discrepancy between X1 and X0W . An important feature of this algorithm is that the synthetic controls must closely reproduce the values that variables with a large predictive power on the outcome of interest take for the unit affected by the intervention. Accordingly, those variables should be assigned large vm weights.

In the empirical application below, we apply a cross-validation method to choose vm. Let Yjt be the outcome of unit j at time t. In addition, let Y1 be a (T1 × 1) vector collecting the post-intervention values of the outcome for the treated unit. That is, $Y_1=(Y_{(1,T_{(0+1)})},\ldots,Y_{(1,T)})$. Similarly, let Y0 be a (T1 ×J) matrix, where column j

contains the post-intervention values of the outcome for unit j + 1. The synthetic control estimator of the effect of the treatment is given by the comparison of post-intervention outcomes between the treated unit, which is exposed to the intervention, and the synthetic control, which is not exposed to the intervention, Y_1 - Y_0 W. That is, for a post-intervention period t (with t ≥ T0), the synthetic control estimator of the effect of the treatment is given by the comparison between the outcome for the treated unit and the outcome for the synthetic control at that period:

$$Y_{1t} - \Sigma_{(j=2)}^{(J+1)} w_j^{\cdot} Y_{jt} \qquad (4)$$

Appendix C: Principal Components: Further Details

In the PCA algorithm, values of each variable are first standardized. Mathematically, this can be done by subtracting the mean and dividing by the standard deviation for each value of each variable. Once the standardization is done, all the variables will be transformed to the same scale. Then, a variance-covariance matrix is calculated in order to compute the eigenvectors and eigenvalues of this matrix. The eigenvalues and eigenvectors are used to understand the principal components. In this way, principal components are constructed as linear combinations of the original variables. The principal components try to store as much information from the original vectors as possible in the first principal component and the eigenvalues order these in descending order (i.e. largest eigenvalue is the first principal component and smallest eigenvalue is the last principal component). Once the eigenvalues are ordered, it is possible to construct a feature vector whereby components with small levels of significance can be discarded. This feature vector is then used to construct a final dataset where the feature vector is multiplied by the original dataset so that the final dataset now has the dimensions of the reduced feature vector.

Figure 1

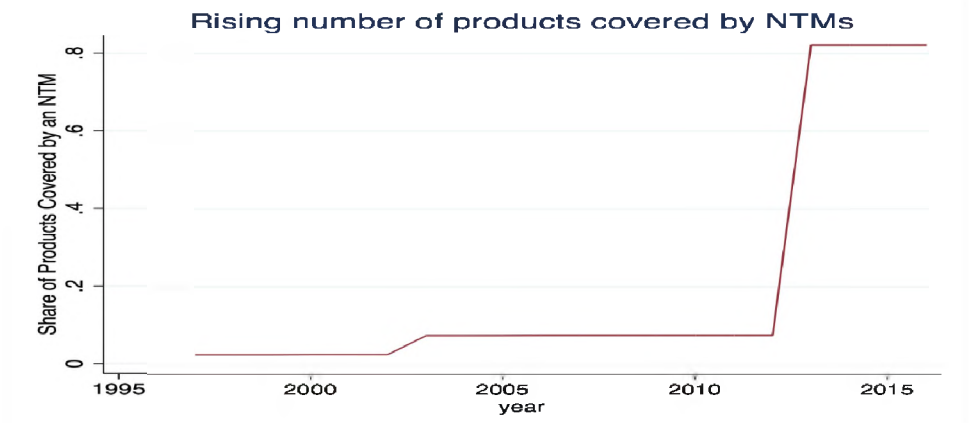


Figure 2: A Timeline of Pakistan's Trade Policy, 1990-2016

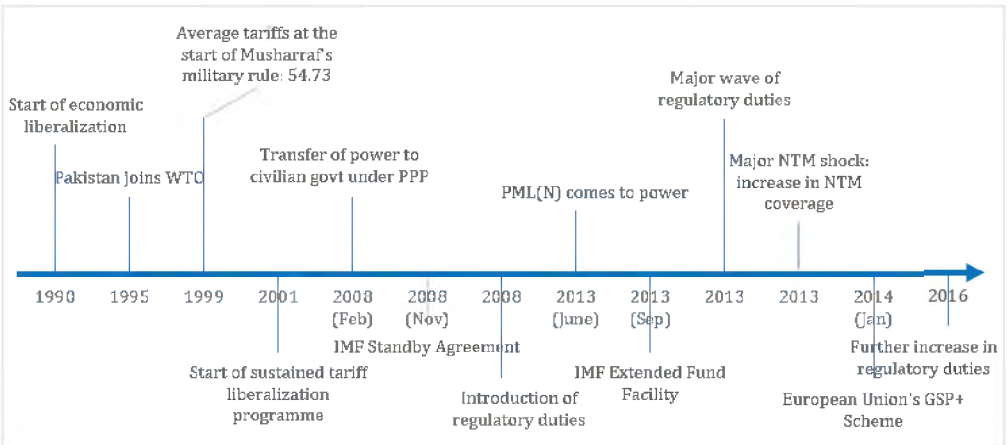


Figure 3: Evolution of Import Duties by Sectors Exposed to Powerful Families

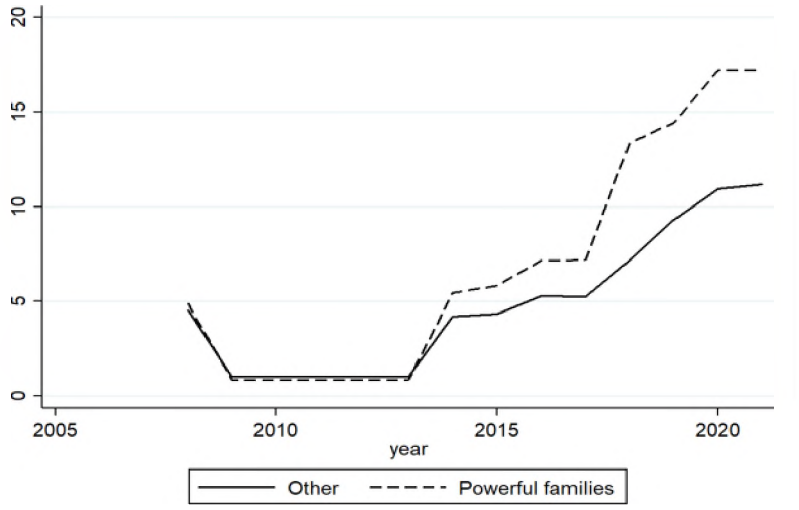


Figure 4: Evolution of Import Duties, by Sectors Exposed to SIGs

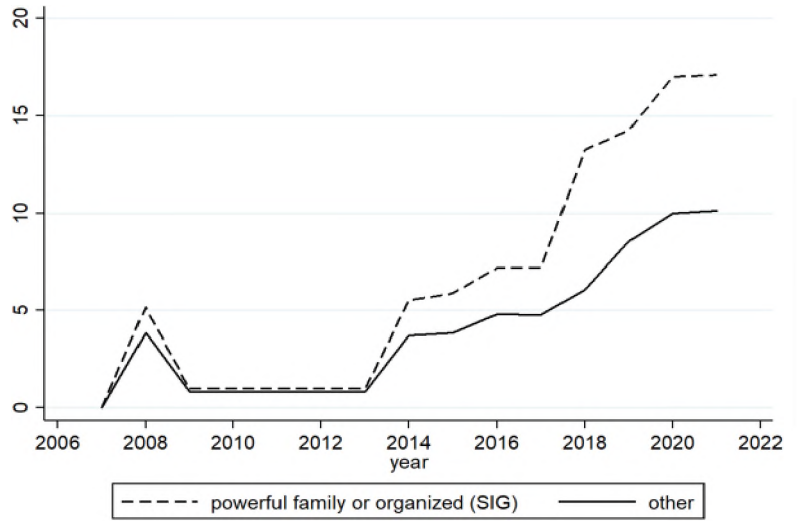


Figure 5: Evolution of Import Duties, by Politically Organized Sectors

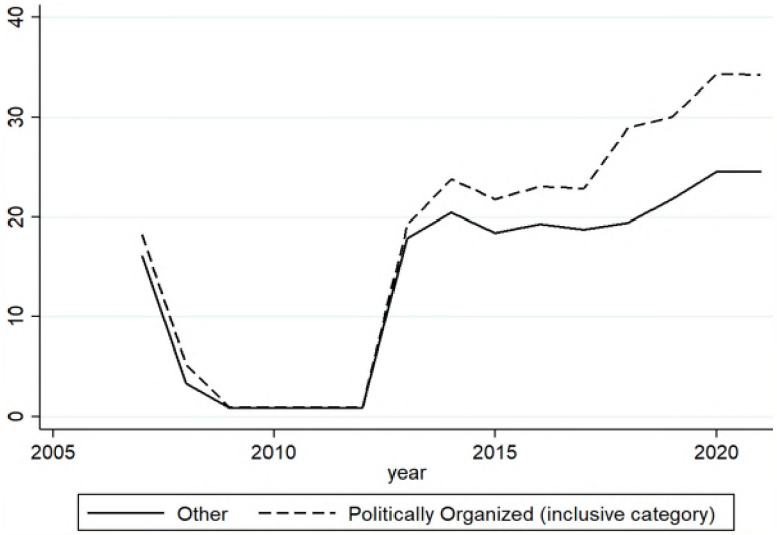


Figure 6

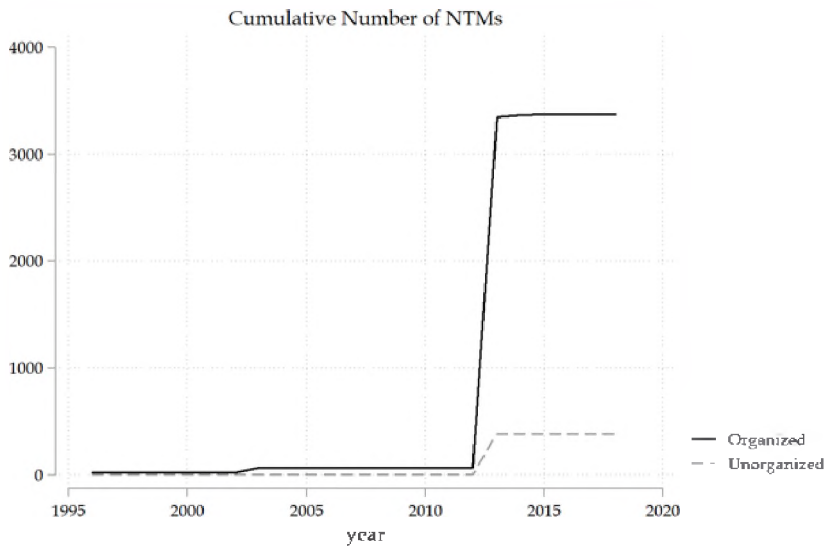


Figure 7

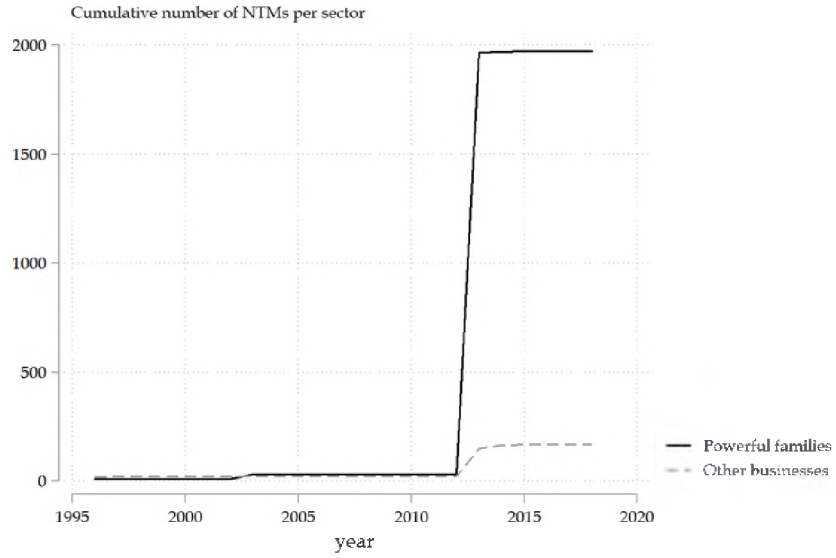


Figure 8

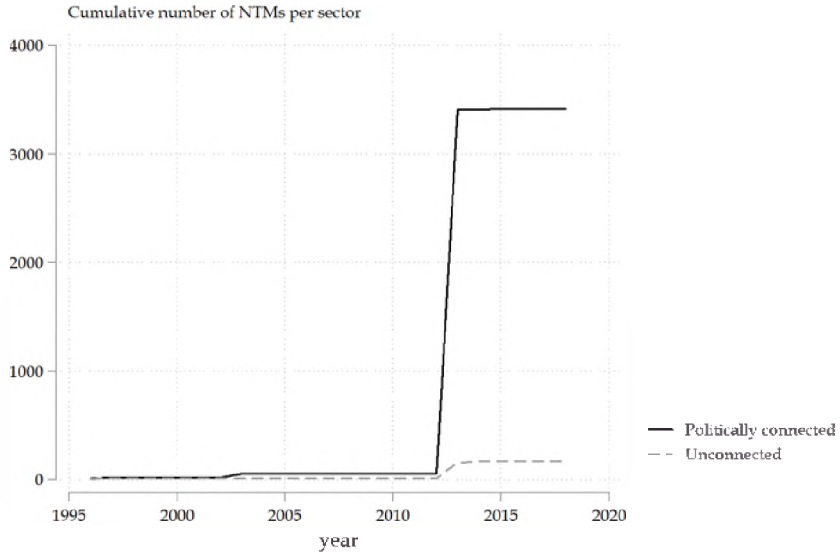


Figure 9

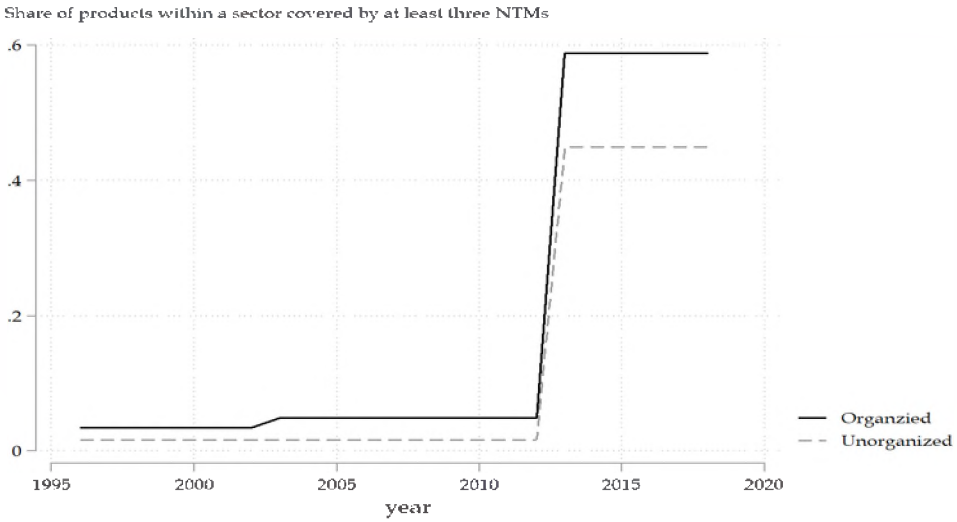


Figure 10

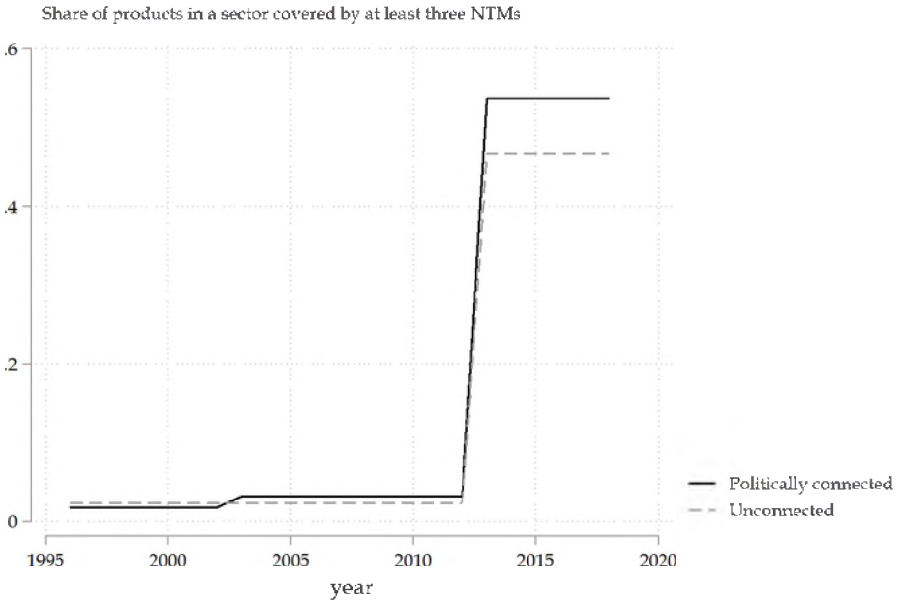


Figure 11

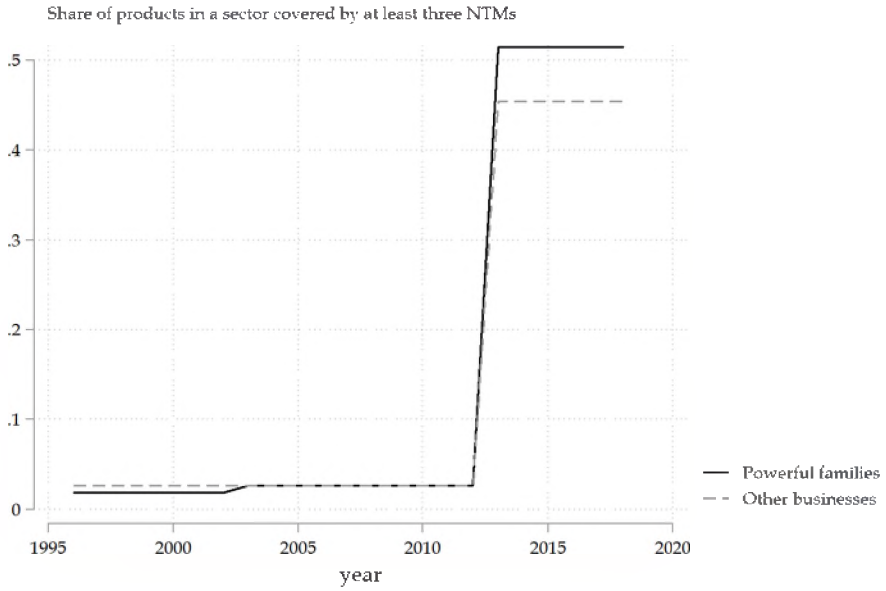


Figure 12

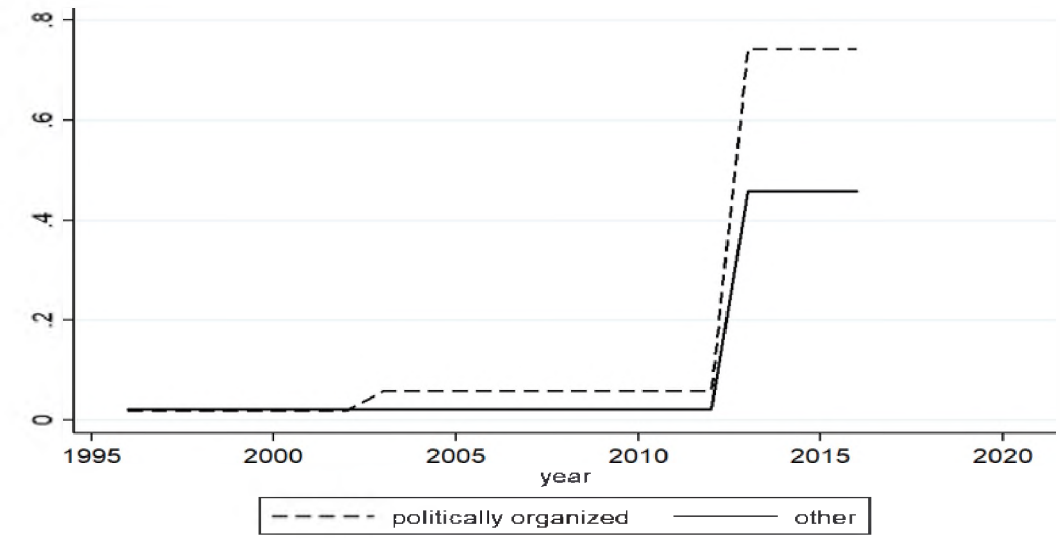


Figure 13

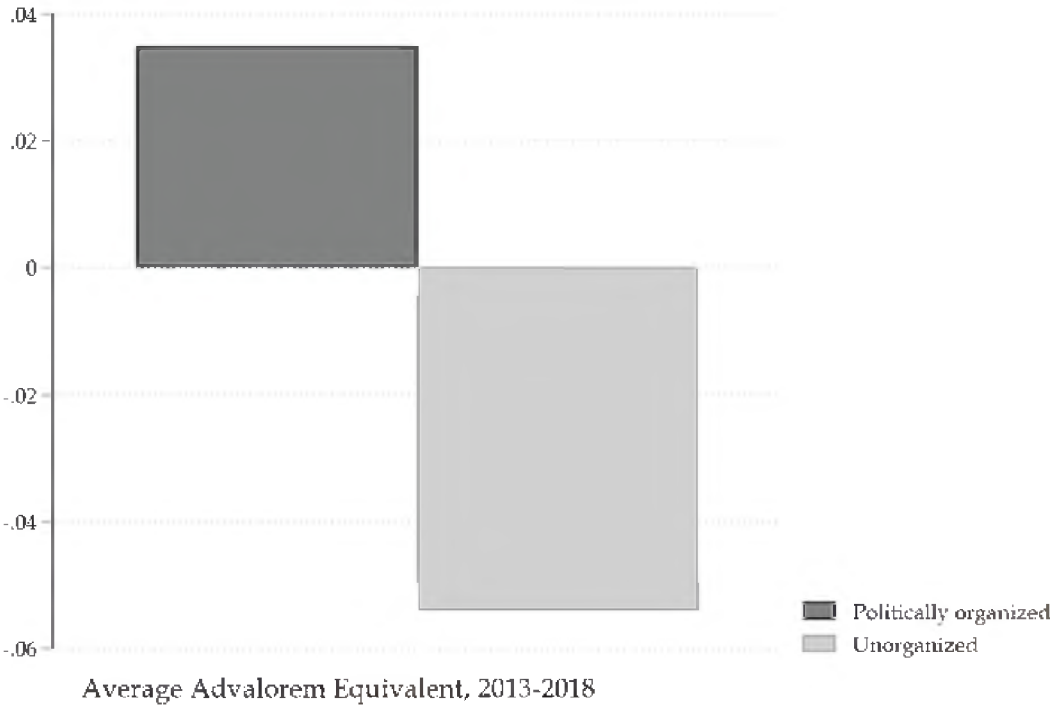


Figure 14

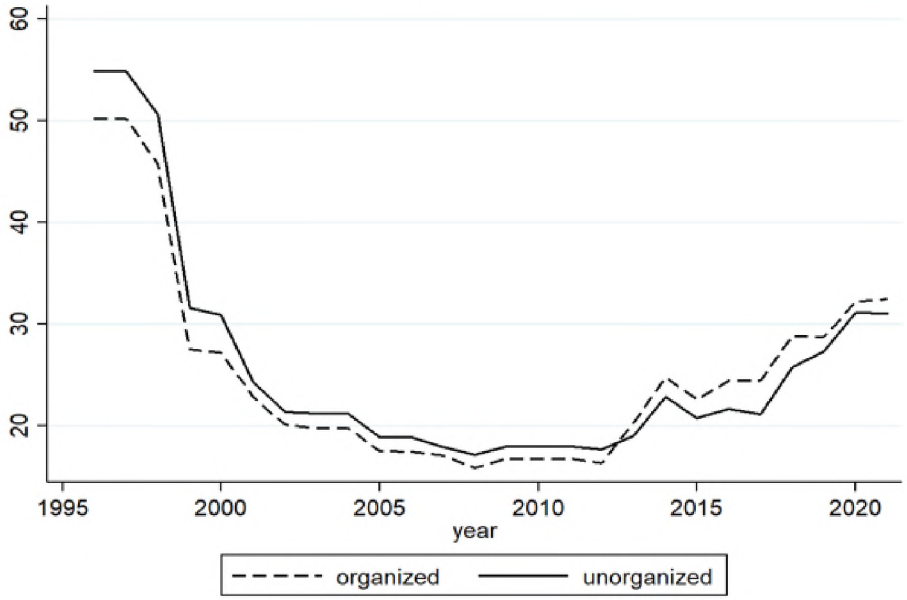


Figure 15

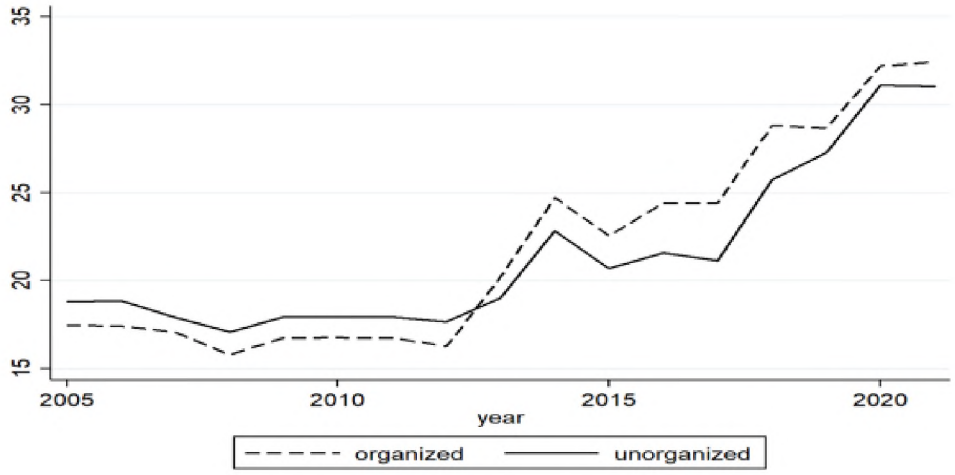


Figure 16

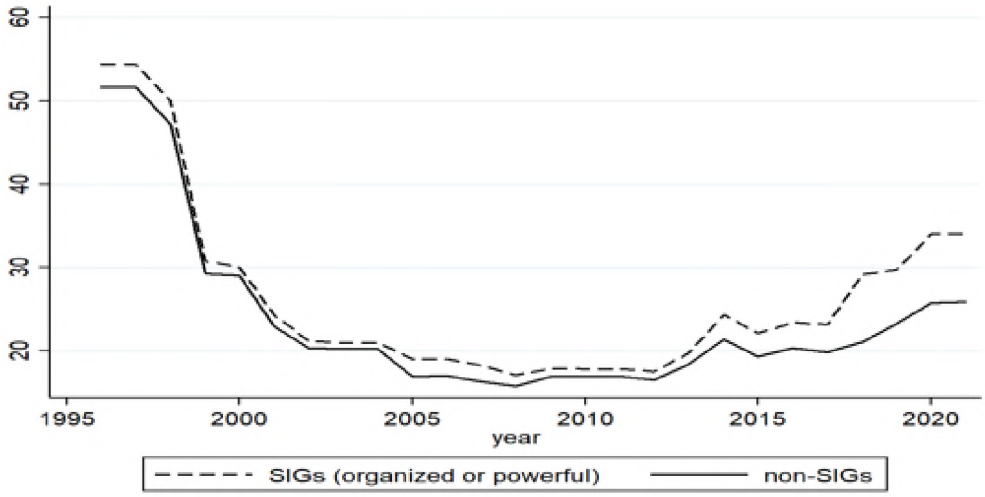


Figure 17

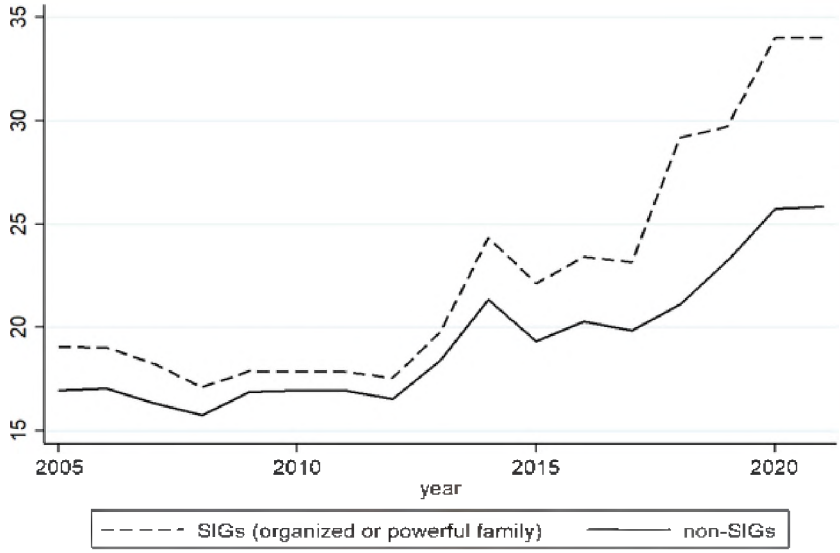


Figure 18

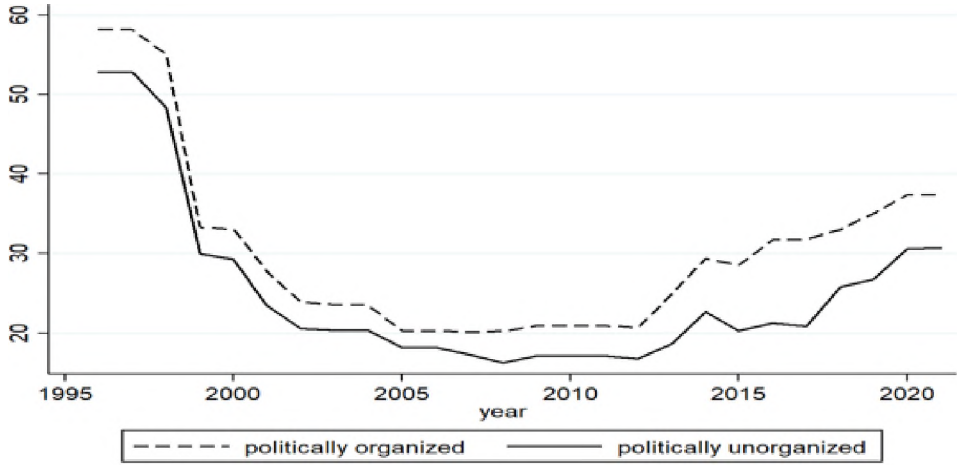
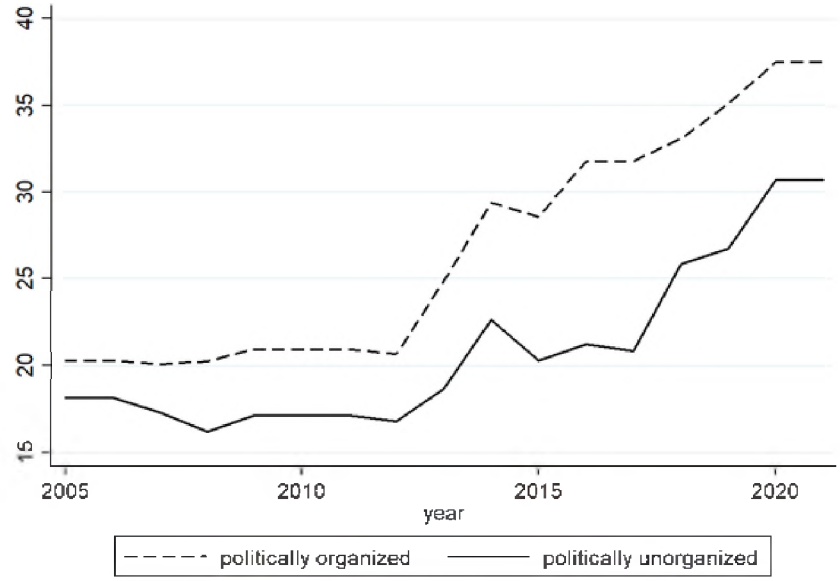


Figure 19



THE PERSPECTIVE OF NATIVE PEOPLE REGARDING DEVELOPMENTAL PROJECTS OF CHINA PAKISTAN ECONOMIC CORRIDOR (CPEC) IN GWADAR, BALOCHISTAN

Zahid Ali and Noor Sanauddin

ABSTRACT

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. Moreover, most of the available studies have taken a quantitative approach, obscuring the genuine voices of the local people. This study has taken a people-centric approach by employing qualitative methods with grounded theory as a research design. The study primarily explored the perspectives of the native people of Gwadar regarding the positive and negative impacts of various projects related to the China-Pakistan Economic Corridor (CPEC). Intensive fieldwork was carried out in Gwadar city to collect data from various groups including the fishermen community, people displaced/ relocated by CPEC projects, daily wage labourers, local community leaders/influential, small businesses, government officials, and students. 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 among the local people. Most of the local people acknowledged and appreciated the development of infrastructure in Gwadar, such as the Gwadar East Bay Expressway, New Gwadar International Airport, and town development under the Gwadar Smart Port City Master Plan. However, the locals have been feeling discriminated against as they see little improvement in their lifestyle. They are facing water scarcity, long hours of electricity load shedding, few employment opportunities, etc. Some people feel that the authorities are deliberately excluding them from the process of development and that outsiders are given more chances to work and settle in Gwadar. Many people have been displaced and many more live under a constant threat of displacement and relocation. The local people are also concerned about the securitisation of the city due to which they feel insecure and like strangers in their city. In particular, the fishing communities have been feeling restrictions on their movement and access to the sea which has affected their fishing business. This research also attempted to arrive at a theory to interpret, predict, and manage the attitude of the local people towards mega development projects. Policy recommendations have been provided at the end of this report to make CPEC more meaningful for the local people of Gwadar and to (re)gain their trust and confidence in the government, which is currently at stake.

1. INTRODUCTION

China-Pakistan Economic Corridor (CPEC) is considered to be a 'game-changer' (Qazilbash, 2017; Khan et al., 2020; 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 (Government of Pakistan, 2017). It is the 6th economic corridor for economic and infrastructure development under the One Belt One Road (OBOR) initiatives of China (Awan, 2017). CPEC starts from Kashgar in Xinjiang, China, to connect Karachi and Gwadar, Pakistan, via the Khunjerab Pass for cementing China-Pakistan economic relations (Government of 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, 2021). As such, there has been a great deal of discussion about CPEC, and its many advantages to Pakistan have been highlighted by experts.

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, Dec 01, 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, Dec. 01, 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? How the local communities as important stakeholders can be made partners in the development projects so that the expectations of the local people are managed in a better way? These and other such questions are the focus of this study.

Research Objectives

The study aimed to achieve the following objectives.

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

Research Questions

The following major research questions were set to guide this research.

- How do the local people understand and react to the various developmental projects of CPEC in Gwadar?
- What are the expectations and aspirations of local people regarding the developmental projects of CPEC in Gwadar?
- What are the concerns and apprehensions of local people regarding the developmental projects of CPEC in Gwadar?
- How different groups of the local people within the area are affected differently by the developmental projects of CPEC in Gwadar?

2. LITERATURE REVIEW

Infrastructural development projects, from the colonial period, have largely informed nation-states' thinking in various ways with respect to the construction of public expressways, railway tracks, and other large infrastructures in the context of post-colonial state formation. The experiences of colonialism continue to shape such thinking in the global South as they attempt to emulate the industrialised West and its material riches, actual framework, and other measures of prosperity (Jamali, 2014). However, 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).

In Pakistan, CPEC development projects will initiate in the city of Gwadar, Balochistan. 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, development projects are not free from negative issues for the inhabitants of the locality of development sites (Mensah, 2016). 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. Furthermore, Mensah (2016) observed that development projects not only assist in the enlargement of foreign exchange profits and benefits to the people but also expose society to numerous risks and disruptions in social life. 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) to study the effects of the China-Pakistan Economic Corridor on the local people in Pakistan based their studies 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. Similarly, 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. Abbas (2019) pointed out that the local people of Gwadar need to be integrated into the process of development otherwise the Pakistani state might face more hurdles and problems in the years to come. 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 of the entire development process." An interesting study conducted by Iftikhar et. al., (2019) argued that there is a 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.' An inclusive city, according to the authors, ensures the rights of its indigenous population and for this purpose, the master plan of the inclusive city should be designed by using the participatory approach. When the local stakeholders are engaged in the process of development then the decision-making process cannot marginalise the vulnerable population because it removes their concerns about the lack of transparency in the process of planning. Unfortunately, this is not the case with Gwadar. Iftikhar et. al., (2019) further noted that there is a high degree of civic awareness among the local population of Gwadar and its' focus has been on developing the capacity of the native people through education and vocational training. This positive energy needs to be harnessed by engaging the residents, activists, and NGOs in the process of planning with the hope to hear the voices of the people of Gwadar to make policies to respect their opinions.

DeGood (2020) 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 further argued 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. 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). For example, the construction of the Sardar Sarovar Dam in India not only affected thousands of people socio-economically but also displaced many people without economic compensation for their lost lands and other resources. The native people were neither consulted nor compensated in the process of construction of the dam. Thus, the economic vulnerabilities of local people increased because of the development of the dam (Flood, 1997). 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. If the development of infrastructure projects is in the interest of a government, then it could expropriate people's land forcefully and resettle the affected communities in other parts and areas. The study concluded that most of the affected people perceive infrastructure development negatively. Thus, Chang et al., (2018) stated that the involvement of the local community plays an integral role in sustainable development in the area of locality. 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.

The displacement of local people by development projects has been the most discussed topic in different Asian countries in the process of economic evolution and urbanisation because they are shifting from subsistence agriculture to the industrial economy. The number of affected people has been increasing predominantly in developing countries like Pakistan, India, Malaysia, and China, where rapid physical infrastructure development is considered a solution to economic development and sustainability. Studying the consequences of displacement because of mega-development projects helps in the cost and benefits analysis of mega-development projects (Neef & Singer, 2015). Policymakers need to create positive and strong ties with affected people to reduce the socio-cultural and economic impacts on them and preserve the social and historical aspects of their culture. Development, displacement, settlement, and resettlement policies required significant legal compensation for the affected and marginalised people of mega-development projects (Abbas, 2019).

The successful implementation of any developmental project is dependent upon the perception and cooperation of the local folks. Hence, it is indispensable to comprehend the perspectives of the local people about the

developmental projects in Gwadar. Butt (2021) observed that in Gwadar, the local population has been ignored in the process of policy preparation, implementation, and protection of the environment. The social development of the Gwadar port city is questionable as the scholarly and environmental organisations have raised various concerns. According to the international treaty law obligation, the state is responsible for taking the public in confidence for decision making. Therefore, the Pakistani government should adopt a transparent policy framework by involving the local people (Butt, 2021).

It might be true that CPEC projects in Gwadar could help revive the ageing 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. The communities most affected in Gwadar must be given a greater voice in shaping various projects (International Crisis Group, 2018).

It should be noted that most of the studies on CPEC have taken a national/international perspective in which the local perspective is almost completely missing. Only journalists have written here and there about the dissident voices of the local people of Balochistan regarding CPEC. Secondly, most academic studies on the topic are quantitative. Only a few qualitative studies (such as Iftikhar et. al., 2019) could be found on the topic in the quest to understand the local perspective in Gwadar.

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. Policymakers must recognise that the viability of CPEC projects rests on the ownership of stakeholders. The locals need to see dividends. Otherwise, their apprehensions will take them farther away from owning the projects which will aggravate social and political divides, fuel tension, and potentially conflict. Instead of suppressing their questions, the fears and suspicions of local people need to be removed by engaging and involving them in development activities. 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. The study strives to better understand the viewpoint of the native people whose lives are going to be directly or indirectly affected significantly (both positively and negatively) by CPEC projects.

3. 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, p. 11). Qualitative research methodology aims to thoroughly explore a particular social phenomenon from a certain social context (Harper, 2011; Grbich, 1999). Unlike quantitative researchers who are interested in understanding "what", qualitative researchers are more interested in "how" (Creswell, 1998). Qualitative research is typically unstructured and exploratory. In this study, we were not interested in determining objective statistical conclusions or in testing a hypothesis, but rather in gaining insights into CPEC projects in Gwadar from the perspectives of the local population.

Research Design: Grounded Theory

The study was conducted by following the grounded theory approach which is more suitable for studies seeking to understand reality from the participants' perspectives. The grounded theory directs the researchers to connect with participants to discover their interpretation of what is occurring and what is "their understanding of the how, why, when, and where of what they and others are doing or experiencing" (Stern & Porr, 2011, p.42). It was developed by Glaser & Strauss (Glaser & Strauss, 1965; Glaser, 1978, 1992; Strauss, 1987). This approach is based on the symbolic interactionism perspective, which provides a systematic framework to investigate social phenomena and explore social reality through interaction with individual research participants to understand the situation (Morse & Field 1995; El Haddad, 2016). It assists in comprehending and exploring the social phenomenon of investigation 'from the viewpoint of those involved and it allows whatever is theoretically

relevant to emerge' (Andersen, Inoue & Walsh, 2013, p. 3). As a result, grounded theorists examine social processes in human social interaction (Hutchinson & Wilson, 1993) to find patterns and processes to comprehend how a group of people describe their reality (Stern & Porr, 2017).

The Universe of the Study

This study was conducted in the city of Gwadar city from June 1, 2021, to September 30, 2021. Situated in the Balochistan province of Pakistan, Gwadar is a fishing town by the Arabian Sea near the Iranian border. It is situated on the southwestern coastline of Balochistan, Pakistan, and is considered an important port city of Pakistan. Gwadar's geo-economic location has become one of the prime motives behind the mega-developmental projects of the China-Pakistan Economic Corridor (CPEC). Geographically and geo-politically the deep seaport of Gwadar is of importance to the world because it lies at the mouth of the Strait of Hormuz (Shahrukh et al., 2020). Gwadar is 120 kilometres away from Turbat in the southwest and 170 kilometres away from Chabahar port city of Sistan and Balochistan province of Iran (Ahmed, 2014).

Gwadar got the status of a district on the 1st of July 1977 (Sarfraz, 1997). It is the largest coastal district of Balochistan with almost a total of 15,216 square kilometres of area and 650 kilometres of coastline. The total population of Gwadar district is around 263,514 with a low population density, whereas the hosting city of port Gwadar has a population of 138,438 (Pakistan Bureau of Statistics, 2017). Around seventy per cent of Gwadar's population depends on fishing and other marine resources as a fundamental source of livelihood (Shahrukh et al., 2020). The Makran coastal highway connects Gwadar with Karachi, whereas Motorway Eight (M-8) connects the port city of Gwadar with the rest of Balochistan leading up to Ratodero, Sindh.

Sample Size and Sampling Procedure

Generally, qualitative analyses require a smaller sample size than quantitative analyses (Ritchie, Lewis & Elam, 2003). However, there are several issues in deciding the sample size for qualitative methods because qualitative researchers usually recommend saturation as a leading principle in the process of sampling (Mason, 2010). Baker & Edwards (2012) state that there are not any fixed criteria for deciding a sample size in a qualitative study but 'it depends' (p. 2) upon the aims and objectives, epistemological and methodological questions, practical positions, and the availability of time and resources while carrying out a qualitative research study. The founders of the grounded theory, Glaser and Strauss (1967) suggested saturation as a suitable evaluating principle for the determination of sample size in a qualitative study.

This study kept saturation as the target during data collection and continued until no new data was coming forth from the fieldwork. Given that a heterogeneous sample was selected for data collection, it was expected that saturation may not be achieved before 50 interviews. While in the field, the research team continued to collect data and stopped after conducting 65 qualitative interviews. Of the 65 interviews, forty-nine were conducted with males, and sixteen interviews were conducted with female participants.

Participants of the Study

The participants of the study were the native people of Gwadar. By native people, we mean the local population of Gwadar whose forefathers have been living in the city. Recent migrants who settled in the city were excluded from the study. As stated earlier, people of heterogeneous socioeconomic and ethnic backgrounds are native to the city, all of whom were affected by CPEC developmental projects in different ways. A large number of these people are dependent on fishing as a source of livelihood, but other occupational groups could also be found in the city. Data for this study were collected from different groups of the local population, including males as well as females. The inclusion of women was important because they are important stakeholders who were affected in a specific way which has been highlighted in the results and discussion section. Keeping in view the cultural sensitivity of purdah and the seclusion of women in the Baloch culture, a female research assistant was hired and trained for collecting data from female participants. The geographical coverage of the current study was Gwadar City. The participants were drawn from all the wards and localities of the city.

Data for the study were collected from the following categories/sub-groups of the local population.

- Fishermen & women
- Displaced people
- Micro businesspersons
- Political people/community leaders
- Daily-wage labourers
- Government official/authority
- Students

A purposive sampling technique was applied to select participants for the study. Purposive sampling refers to the intentional selection of participants from the population who has particular pieces of knowledge of the phenomenon of interest and provide relevant information regarding the research study (Liamputtong, 2009; Polit & Beck 2012; Schneider et al., 2013). Glaser, one of the founding fathers of grounded theory, also suggested a purposive sampling method in the selection of the participants (Glaser, 1978). Moreover, Graneheim and Lundman (2004) stated that a purposeful sampling technique helps the researcher to select participants with experiences and knowledge who can offer insight into the topic of interest critically to maintain the reliability of qualitative investigation.

The participants of the study were approached purposefully by keeping in mind that they provide particular knowledge of the phenomenon and relevant information about the study. The participants of the study were carefully selected by following research ethics such as confidentiality, anonymity, and informed consent.

Tool of Data Collection: Interview Guide

Interviewing has been traditionally associated with qualitative research which focuses on the exploration of values, meanings, beliefs, thoughts, experiences, and feelings regarding the phenomenon under investigation (Creswell, 2007). Polit & Beck (2008) and Stern & Porr (2011) regard in-depth interviewing as the most commonly used technique of data collection in the study of grounded theory. The researchers used an interview guide for collecting in-depth qualitative data. Moreover, the research team took field notes during the survey and interviews.

Pilot Study

A pilot study was conducted to test the feasibility of the research method, including the sampling procedure and the tool of data collection. After conducting the pilot study, we used the lessons learned from the pilot study and reviewed, refined, and finalised the sampling procedure and the interview guide accordingly. An important purpose behind piloting the study was to see the feasibility of the fieldwork in the context of Covid-19. Covid-19 restricted the movement of people which jeopardised the fieldwork to some extent at the end of July and August 2021. In this case, the health and safety of research participants and the research team were the primary concern during this research. All possible measures were taken to minimise the risk during the fieldwork, including a strike adherence to the SOPs advised by the Government of Pakistan and the World Health Organization.

Ethical Considerations

We were aware of the ethical and political sensitivities surrounding this research. We took all possible precautionary measures while researching without jeopardising the interest of participants as well as other stakeholders of CPEC. The research team was thoroughly oriented to keep neutrality during the data collection and analysis. The participants of the study were briefed about the study and their consent was obtained regarding their participation in the study. The participants were also informed about the use of voice-recorder during the interviews and their consent was obtained for this purpose. In cases where the participants refused to give their consent for interviews or recording, their choice was respected and were excused accordingly.

Data Analysis

The grounded theory methodology suggests a simultaneous process of data gathering and analysis through a constant comparative method. The constant comparative method enables the researcher to analyse data to make more suitable interviews. In grounded theory, the constant comparative method facilitates the emergence of themes (Engward, 2013; Olson et al., 2016). The categorisation and comparative analysis and data collection started immediately and simultaneously in this research. Moreover, as per the requirement of the constant comparative method, analysis of transcription was conducted again and again to accurately comprehend the perspectives of the participants and to identify common themes from various perspectives. Therefore, the researcher examined interviews of the participants several times to make sure the perspectives of the participants were captured, and the categorisation was made appropriately to conduct a constant comparative method in the present study.

The grounded theory was used as the method of data analysis which suggested three types of coding of the data such as open coding, axial coding, and selective coding. According to the guided process of the grounded theory, the process of identifying, coding, and categorising the data is in process. This method guided us to be focused and consistent with the data by following the iterative process of data collection, transcription, and analysis of the data. The recorded interviews were transcribed into note pads and the transcriptions were rechecked for any errors and missing ideas or points. The interviewers made themselves familiar with the data by reading the transcriptions of the interviews and field notes again and again. The interviewers listened again and again to the recordings to maintain neutrality and correct the errors which occurred during transcriptions of the interviews. Following the guided steps of coding the data, the research team started the process of reading the transcripts of each interview thoroughly and properly and generated the primary process of open coding of the data and the codes were read again and again to make the process of axial coding easy and, finally, the research team moved to selective coding. Thus, these all processes were followed in the data analysis of this study according to the guidance of grounded theory. Iteration or consistent comparative analysis was followed for drafting the final report.

4. FINDINGS AND DISCUSSION

This section of the research paper discusses the major findings of the study. The section has been divided into different thematic headings, roughly corresponding to various objectives of the study. This includes the knowledge and attitude of the local people regarding various development projects of 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.

"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 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. There seems to be secrecy around CPEC projects; neither the local people seem to be interested to know about the projects nor do the CPEC authorities bother much to disclose and publicise the nature of various 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. People mostly understood it as a project invested by China and that China is planning to come to Gwadar. A female student 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 who was interviewed for this project stated, "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 many details about the components of CPEC executed in Gwadar city. When the participants were asked regarding components of CPEC such as the new international airport, dredging of berthing areas and channels, Pak-China Friendship Hospital, Free Industrial Zone, etc. in Gwadar, a relocated male participant said that "All these [facilities] are not in our access, they are not for us. That's why I don't know much about them."

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." Another male working in a fishing factory explained that "Due to CPEC, we have got good roads, an east expressway, the construction of the breakwater and Pak-China Hospital. Otherwise, we won't get these things if CPEC was not initiated in Gwadar." However, the majority of the participants interviewed for this study were not very positive about the development activities in Gwadar. 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."

Local politicians and influential people had a mixed attitude; while some were focusing on how CPEC will have a positive impact on future generations, others were protesting against the cost being borne by the current generation. "Who lives to see the long-term benefits of CPEC?" expressed one politician. He continued by saying that "while some people are definitely benefiting from CPEC, including some locals, but mostly the outsiders are getting jobs and other benefits. The locals are deprived of whatever they had earlier." In short, local people have limited and vague knowledge about the various development projects in Gwadar. Similarly, 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.

Shattered Dreams: Expectations and Disappointments of Local People

The government and media had 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. Almost all participants shared that they had expected to get all facilities of life, especially clean drinking water, electricity, education, health, employment opportunities, and a bright future in Gwadar. 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. The local people also referred to earlier development projects in Gwadar in 1988 where a Belgium-based company provided health, education, water, and sanitation facilities to local people. They expected the same from CPEC.

A female university student explained, "When I heard about this project, I felt very happy that Gwadar was moving towards development and success." Another 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 a happy life. I got very happy at that time. … but most of these things didn't come true".

The history of the development of Gwadar is very old. Different countries and organisations had come and constructed different facilities from time to time. It was found during the fieldwork that the local people describe other companies before the Chinese in a positive light. It is believed that in the past companies and countries tried to involve local people in the development works and provided incentives to the locals. When CPEC/Chinese came, local people also expected a lot as it had happened in past. However, people were disappointed to find out that the Chinese companies were not eager to involve the locals in the development process. A government official of Gwadar port narrated that:

> "We have seen the working environment here in 1986, 1988, and 2002 when Gwadar Mini port was constructed for fish harbour by Belgium with the support of Pakistan and European funding. We have seen those Whites [Goras] who constructed the jetty of Pasni. Their working environment was much better than the Chinese. Even for a small medical treatment and small disease they would send the people directly to Agha Khan Karachi or bring facilities from Muscat to facilitate the local people. The local people happily worked with them. Those local people are still alive and say that benefits provided by the European companies are not being provided by the Chinese."

It is very interesting to mention that 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. When CPEC was announced in Gwadar by the Government of Pakistan with the help of China, the common masses also harboured such dreams and expected that Gwadar would become developed like Dubai. A female student at the University of Gwadar 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. (وھدے کہ اولی رندا ءَ کہ سی پیکے پاروا ھشکت گڈاں ما سرپد بوتاں کہ گوادر چو دبئی بیت اِنت۔) We would get job opportunities and everyone would live a happy life".

The population of Gwadar have 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."

A daily wager recalled that:

> "I expected that there would be buildings and factories in Gwadar…. and then there will be job opportunities for the local people. It would be a very nice thing, but I have seen nothing of such sort. (کورین چماں پڈے ھرس باز اِنت۔) We just hear CPEC, CPEC, and CPEC."

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. As one of the interviewees said, "If such mega projects like CPEC cannot provide drinking water, better schooling, and health, then what else we should expect from it." 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:

> "When Gwadar Mini port was built by a Singaporean company, our fishing community was happy because their jetty was also built at that time and got better livelihood opportunities. 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.

Good for Gwadar, not good for Gwadaris

Though most of the local people were pessimistic about their future, almost all of them agreed that Gwadar will develop one day. They believed that CPEC will bring prosperity to Gwadar city in the long run. At the same time, however, the local people, especially the poor have developed feelings that they will not see a positive impact in their lifetime. A fisherman remarked that "I am not sure these projects are meant to facilitate us or our children. Maybe our grandchildren will see a good time.".A similar answer was given by an old man who worked as a construction worker: "The construction that you see here is not for the local people; these are for people who we don't know. Maybe the Chinese or maybe people from other parts of Pakistan." Similar other expressions from the participants indicated that they had witnessed the rapid development of Gwadar city, but at the same time, they felt excluded from the process. A local politician put it bluntly:

> "CPEC is good for the future of Gwadar city, but not good for the local Gwadari… Gwadar will become a developed city, it will bring prosperity to people living here, but I don't know if we will live long enough to see those days or not."

It was observed that the local officials were more optimistic regarding the future of Gwadar. They believed that CPEC would bring development to Gwadar city and its residences of Gwadar shortly. One of the officials explained:

> "See, definitely, the local people have a lot of expectations, and they want to grow mustard in their palms. They seek immediate benefit. But things do not work according to our expectations. Gwadar is bound to develop because of CPEC, but people have to wait for it."

Another official elaborated that:

> "Let the port start proper operation and other projects complete, you will see an increase in business opportunities, more jobs, and better facilities of life. It will bring prosperity. There are water and electricity problems but will be solved soon. A beautiful future is waiting for the people of Gwadar. (گوادرے مردمانی واستءَ گہتری کیت اِنت ءُ گوادرے مردمانی وشین باندتے راھچار اَنت۔) ".

Along with this, some participants also pointed out that most of the opportunities provided by CPEC projects were being cashed by rich people, both local and non-local, while the poor and ordinary local people were suffering as collateral damage. A female student, for example, pointed out that most of the educational opportunities, such as scholarships were availed by rich people, not the poor. A local businessman said that the "CPEC has provided business opportunities, but you need to have some capital to avail of these". Similar other comments indicate that the CPEC is indeed showing positive results in the shape of providing educational and business opportunities, but mostly poor people fail to benefit from these due to various personal and structural reasons.

A daily wage labourer also pointed out how most of the benefits of CPEC were going to the rich people:

> "The rich people might enjoy the fruits of CPEC by establishing their businesses, renting their houses, and flats, or selling out their lands but the poor people have nothing more than catching fish in the sea or working as labourers in factories".

Similarly, a fisherman stated that:

> "We the fishermen are already the left out and are a neglected segment of society. Our children and we are illiterate. Our livelihood depends on fishing. CPEC has created job opportunities in different projects and

> industries, but we know that our fate will not change much. Mostly the rich will avail jobs and establish their businesses".

It has been found that CPEC is creating business and employment opportunities, but the people believed that there is an unequal chance among the people because of their socioeconomic status to avail and exploit the opportunities. Projects such as Gwadar Port, airport, China Business Centre (CBC), China Overseas Port Holding Company (COPHC) etc. are the major job providers where thousands of people are currently working. While most of the executive and supervisory positions are occupied by Chinese and Pakistanis from outside Gwadar, the local people of Gwadar mostly work as drivers and manual labourers. Their lack of education and language skills, especially their inability to communicate in the Chinese language, makes them least attractive to employers. For example, a participant working as a small contractor said that:

> "Those who can speak a little bit of Chinese or those who are mechanics or plumbers, or masons usually get jobs but most of our people (i.e., the locals) are illiterate and do not have such skills".

The same point was further explained by a community leader:

> "Some people are working in China Business Centre (CBC). The skilful locals hold professional posts such as computer operators or management positions and the unskillful locals are hired as peons or security guards as well. But locals are not taken in large numbers, outsiders are preferred in most cases."

It is a known fact that mega projects usually avoid hiring a large number of local people because they are afraid that the local people are more likely to form a labour union and are in a better position to bargain for higher wages. This was hinted at by a government official who said that:

> "The locals are usually busy in politics more than work".

These remarks of the participants could not be substantiated with empirical data from the field but it could be true that employers in Gwadar prefer non-locals because of their superior skills and lower bargaining power. According to one participant, "98 per cent of the employees are non-locals, most of them from Makran division." This seems to be a greatly exaggerated figure. In fact, it was found that some local people of Gwadar use exaggeration as a strategy to emphasise their losses and to stress their rights.

It is commonly seen that poor people think that CPEC will not change their fate as they neither own land nor rental houses, capital, and business. Those people will benefit the most from CPEC who are rich and educated, whereas working-class people like fishermen and daily labourers, who constitute roughly 70% of the local people, will not get much from CPEC.

On the other hand, some local people having capital in the form of skills, money, or land have benefited from the vast opportunities brought by CPEC to Gwadar. People having marketable skills have found good jobs in various projects. Prices of land have increased manifold and rents of houses have gone up. Businesses have improved considerably and people with entrepreneurial spirits are venturing into new business ideas such as the establishment of a tourist company. But these are few people among most of Gwadaris who are unable to get a reasonable share in the spoils of CPEC. In other words, local people have witnessed a visible change in the infrastructure of the city. They agree that Gwadar will become Dubai one day. However, most of them are not hopeful that they will see it happening in their lifetime. The current generation of Gwadaris will witness the rapid rise of Gwadar city, but their generation, especially the poor people, such as fishing communities, might not enjoy its associated benefit.

"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. The physical infrastructure, especially the networks of roads and highways alone will be enough to connect Gwadar with the rest of the country and create economic opportunities and promote local and international business. Because of these roads, Gwadar is no more an isolated, faraway place. 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 female student remarked:

> "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 us. 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. Before its construction in 2004, the local people of the Gwadar region used to take three days to travel about 700 kilometres for medical treatment, education, etc. but now it is reduced to 6-7 hours to reach Karachi (Iftikhar et al., 2019). It is peculiarly clear that the local people are also the beneficiaries of the road. 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 the 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 had become successful in making money. A young educated participant, for example, disclosed that he had recently opened a tourist company which has started giving good earnings for him. A boat maker shared that his business had increased manifold since the inception of CPEC and hoped that his small workshop will become a company in the near future. However, most of the local people lack education, skills and, the required confidence to start a business. Apart from transportation, roads, airports, etc., CPEC has also promoted tourism in Gwadar. Different tourist attractions have been constructed and people from other districts of Balochistan as well as Pakistan come for visit. The coming of tourists automatically benefits the locals and the local hospitality industry. In an interview, 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). Gwadar has become very famous in the national and even in international media and it has greatly attracted people to visit the city of Gwadar and enjoy the beaches and watch the beauty and development works. Journalists visit the town of Gwadar to get a sense of the reality, while the arrival of the workforce from different areas has resulted in a multi-cultural city. This aspect of Gwadar will increase over time.

A beautiful cricket stadium has been constructed in a corner of the city which will go a long way in promoting sports in Gwadar. A construction worker explained that:

> "People from outside come to see the stadium and take photographs and enjoy stay in Gwadar. This is a good trend as this will promote tourism. CPEC has also enhanced the beauty of Gwadar City with its parks and gardens."

A male political leader admired the development of Gwadar city and commented that:

> "I don't know how the people measure the improvement of living standards. Marine drive is established, and everyone can see and visit it to refresh themselves. Family members come to enjoy the park and people

do jogging under the lights."

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. A local political leader explained the opportunities brought about by CPEC for the common people:

> "The coastal highway and Gwadar Port in Gwadar have greatly eased our lives. The coastal highway from Jiwani to Karachi makes our life easy because of all the things that come from Karachi. We visit Karachi for treatment as well as our children go for education there. Some local politicians and groups have been trying to ignore the positive development going on in Gwadar and elsewhere in the province. Of course, there are issues, and the local people are justified in protesting, but the positive aspect of CPEC should not be completely ignored. Our people are short-sighted. As time goes, more positivity will become visible to people".

Another positive development which was pointed out by many participants includes the improved and modern health facilities. Earlier, Gwadar was considered a remote place with negligible health facilities. People used to travel to Karachi and other cities for minor medical treatment. The Pak-China friendship hospital, a project of CPEC in Gwadar city, is seen as local people-oriented because the local people directly get health facilities and services. A local man explained that before CPEC, no reliable surgeon was available in Gwadar and that health services have greatly improved with the construction of the Pak-China hospital. Almost all participants expressed their joy over the construction of the hospital and termed it as a tangible benefit of CPEC for the local population. Similarly, CPEC has also improved the educational sector in Gwadar. A vocational training centre has been constructed here which is aimed at providing vocational training to the local youths. An official explained that:

> "People are getting a quality education and also through CPEC, we have a vocational training centre which is going to be functional soon. More such projects are coming in the future."

At the same time, some participants pointed out the need for more educational infrastructure in Gwadar. Most of the participants were of the view that education had not received its due attention in the CPEC project. Except for a technical centre and a school, not much can be seen for improving the educational level or standard in Gwadar. 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 roads. Land prices increased. Investors and other people from the outside will bring new ideas and cultural diversity which will make Gwadar a beautiful city."

Another businessperson shared that:

> "For the last 5 to 6 years, I have seen changes and improvements in my business slowly and gradually through my hard work. So, I don't know if the improvement in my business is due to CPEC or the overpopulation of Gwadar city."

It can be inferred from the above comment that 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.

Another impact of the increasing population of Gwadar is an increase in the prices of land. Many people have migrated to the city for better living standards and investment. Similarly, the non-local investors have started real estate businesses due to which the prices of land and houses have seen an upward trend. For example, Patel Group and Taloo Group are two business groups in Pakistan that came to buy lands in Gwadar. The increase in prices of land is generally considered a positive impact of CPEC. On the other hand, some participants believed that the blind sale of land by the local people to the non-locals was an economic loss, in the long run. An official recalled that,

> "In 2000 the price of land in Gwadar was very low. … one acre of land was sold from 2,000 to 5,000 rupees. The prices of the land went up when the first port was built. The people of Gwadar did not understand the situation and they sold their lands to non-local investors. I told many people that Gwadar was going to be developed and prices of land would increase but they laughed at me."

The increase in the prices of land is considered a short-term benefit for locals. A student argued that an increase in the prices of land is positive in the short-term only; in the longer term, it is a loss of land to non-locals.

A fisherman explained the increasing business opportunities in the city:

> "Many people are migrating to Gwadar and rents of houses are increasing. You can earn a lot if you have a house for rent in the city. Businesses are increasing, and many shops and markets are being built up in the city. For example, after the construction of Marine drive, some people opened tea and fry shops. We hope by the passage of time we all will get benefit from CPEC in some ways."

Local people have benefited greatly from this trend and most of them have sold their agricultural and barren land at high prices to investors who have initiated housing colonies around the city. At the same time, poor people have suffered who are being pushed out of the city or restricted to urban ghettos. This has been explained later in detail.

In short, the high expectations and rosy pictures associated by the local population of Gwadar with CPEC have not come true in totality. At the same time, the light is visible at the end of the tunnel as 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 (Irazabal Zurit et al., 2016). In Gwadar, there are a few signs that local people are part of the process.

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.

It was also found that, in some cases, 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."

Another male relocated participant elaborated on the relocation and compensation mechanism:

> "We were compensated properly. (ٹھیک ٹھاک دیا گیا۔)They first counted the rooms and saw the structure of the house. Later they measured the land and according to all details we were given money. And we were given Rs. 3,450,000. Our lives have changed positively. (ہماری زندگی بہتر ہو گئی۔) Here we feel safe but there we were afraid that the water might wash away our homes, as our homes were very close to the sea. This place is safe and has good facilities".

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. Most people willingly relocated for the money which was offered by the government. A relocated person shared how they were relocated:

> "We were consulted, and we were issued notice before relocation. They also told us, again and again, to be prepared for the displacement. They have made our walls and provided us with money for the construction of houses. After completion of all things, they gave us a 5-month deadline for shifting. They also had given flats to every family in the Singhar housing scheme. It was very nice for us."

It must be noted here that many people, later on, sold the flats provided to them by the government for various reasons. It also needs to be noted that relocation had both positive and negative impacts on people. Relocation/displacement has affected education, health, livelihood, businesses, and socio-cultural aspects of people's lives. 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. We all were neighbours and relatives there. Now here we have to interact with unrelated people. Our children's education is affected because the schools are far away, and transportation is costly".

It is evident from the above excerpt that the relocated people have to live far away from the sea and the city, making it difficult for them to earn a livelihood. Moreover, people feel nostalgic about the social structure and communal life of their old village, which has been replaced by a feeling of estrangement in the new location. An old man contrasted the cost and benefits of relocation:

> "Before, we were living in a very congested place. Now we have a large house in a beautiful area. We lost our native land but received a handsome amount from the government. We feel happy here, but we miss the sea which is far away now. We would easily go to the sea for fishing but now we face difficulties of transport and security."

It can be argued that the government has successfully managed the relocation issue. People feel satisfied with the process and the compensation received. At the same time, however, some relocated people claimed that they were still waiting for some of the promises to be fulfilled:

> "We are well compensated, (ـگتک ریھ و روگ رس ارام) and we are happy in our new house but still, the government has not provided us electricity, water, hospital, and schools which were promised."

Such complaints seemed to be crosscutting among all communities in Gwadar, whether relocated or not. 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. Some of them may not have found alternate means of livelihood. They also have issues with mobility and access to health and education facilities in their new homes which are far away from the city. 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.

"A Sword is Hanging above our Heads". Fear of Displacement among the Local People

CPEC-related projects have caused what is known as "development-induced displacement." Displacement and

relocation have been an issue in Pakistan since the beginning. Although earlier mega projects in Pakistan, such as Terbela Dam and Mangla Dam, played an important role in the economic development of the country, they caused havoc in terms of the displacement of thousands of people from their ancestral homes and habitats. Mangla Dam alone caused the displacement of more than 110,000 people (Kayani, 2012) while 96000 thousand people from 120 villages were displaced by Terbela Dam. Data shows that 17 per cent of the displaced did not receive compensation for their assets and ancestral land (Izhra-ul-Haq, 2007). Similarly, the Lyari Expressway in Karachi has displaced thousands of people who lost their livelihoods. They have been resettled in Hawkes Bay and Taise Town which is far away from their work in the city of Karachi and due to the lack of early public transport service, these people are mostly not able to continue their work in the city of Karachi (Zubeida, 2006).

As discussed earlier, CPEC-related development projects in Gwadar have 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. In the first master plan in 2004 and 2005, the areas of the old population of Gwadar from Gwadar port to Javed Complex were not mentioned as residential areas. Rather, these areas were referred to as commercial and warehouses area. 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 East Bay Expressway has already limited the access of people to the sea. The people of New Mullah Band who were previously relocated in the first phase of the Gwadar port construction mentioned some reports that they will be again relocated because of the construction of government offices in the area. A female student expressed her view regarding the fears of locals:

> "People are afraid that the old city will be shifted from here. Since CPEC will result in some big projects, it will need a large space. Their jetty is also being shifted to Sur which will be bad for them. The people will get compelled to migrate, as they are not safe here."

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. The fear of displacement becomes part of the lives of poor people living in Gwadar. 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…The local poor have nothing but a piece of land which is being taken away."

Due to this fear, there is uncertainty among the locals, especially the poor who live near the sites of mega-projects. A male shopkeeper remarked that

> "The worry occupies my mind sometimes. That's why I am not investing in my business here as I am not sure if we will be allowed to stay here for longer. Many people say that one day we will be asked to leave."

A female student had a similar opinion and even predicted that "As long as CPEC projects are completed, the government will ask the local people to take the money and go elsewhere. It has already happened; people have been taken out from their village behind the airport." A male daily wage labourer said that "We are afraid that one day after the completion of these mega-projects, these non-locals (Sindhi, Punjabi, Chinese, etc.) would kick the native residents out of Gwadar."

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.

When we asked some participants whether they would like to willingly relocate and get compensation for their homes and land or not, some interviewees expressed anger that CPEC will snatch their ancestral land from them.

Other participants, however, seemed to be willing if they receive a good bargain. One old man said:

> "Money is attractive, but our home is our home. Besides, it depends on what else is being offered apart from money. If employment is given, for example, then people might be willing to leave their homes."

A women participant, who was an active social and political worker, pointed out that "The biggest fear of the locals is that they will be displaced from here in the future. This sea where we are working and earning will not be ours tomorrow." Similar remarks were received from 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."

There is a general and constant fear of displacement among the local population, especially those who are poor and those who live closer to the sites of major development projects. It also seems the people might be willing to relocate provided that the government ensure proper compensation to them not only in cash but also in kind, such as jobs and alternative employment opportunities.

It can be concluded that the fear of displacement was not equally perceived by various categories of participants. Not all people viewed displacement as a terrible thing if, in return, they expect to receive good compensation and better livelihoods. For instance, 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.

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. Most people are uneducated, and they don't even know the nature and purposes of various projects. They are not feeling a sense of relationship with the new developments going on in Gwadar."

These remarks from a participant explain that there is a 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:

> "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. Almost 45% are Balochi speakers, whereas 55% are not Balochi speakers. If tomorrow they get domiciled/locality, then our slogan would be 'quota for Gwadaris' as the local people are becoming a minority."

It can be noted that the participant in the above statement exaggerated the number of 'outsiders.' 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.

The relocation of the locals coupled with the influx of people from other districts and provinces is changing the identity and outlook of Gwadar. 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

> "آ همے ترساں کہ وتی شہرءَ را دارمدے ہاں۔"
> "They fear that in future they will be strangers in their own city."

The local people of Gwadar use the word ڈنھی meaning 'outsiders.' This word is used generically to refer to all people from outside Gwadar, including people from the neighbouring districts of Kech, Panjgoor, Awaran, Khuzdar etc. even if these people are Baloch by ethnicity and speak Balochi.

As pointed out earlier, there seems to be a communication gap between the CPEC authority and the local people. People know less about CPEC and the future plans of the central government in Gwadar. A small businessman claimed that up to 90 per cent of the locals were unaware of the development projects because the authorities do the work secretly and they do not inform the locals about these projects. This situation is one of the reasons why the local people have developed a feeling of alienation. They mostly do not understand what is going on in their city. The authorities make little effort to include the local people in the process of development. This issue has important consequences. Because development authorities such as GDA and GPA are not politically accountable to the local people of Gwadar, i.e., they report directly to the provincial and federal governments who provide development funds for their projects. Thus, their officers do not feel obliged to explain their projects and development activities to the local people. Hence, the feeling of estrangement among the people.

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. For instance, a male micro businessman stated that:

> "I say it (immigration) will damage the local culture, language, and history because people are coming from outside here with different cultures, languages, history, and identities which will marginalise local culture and local people and the locals may lose their identity and culture. There will be a mix-culture, language, identity, customs and traditions, etc.

When asked for an example of how the history of Gwadar was vanishing, a senior, educated participant pointed out:

> "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. As a result, the locals feel that Gwadar is getting away from 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. Marri (2021) has observed that the negligence of the local authorities has resulted in the eventual deterioration of the historical places in Gwadar. The inhabitants of Gwadar town have resisted the development with the hopes of protecting their surroundings/neighbourhoods, identity, and historical places. As a result, the Chinese architects and planners used an alternative strategy under the framework of the Belt and Road Initiative due to unsuccessful attempts of previous planning. The strategy aimed to negotiate the process of development with the public to legitimately preserve the historical sites and design new infrastructure to emulate the local architectural identity. Thus, the dominant policies of the state are not always successful rather negotiations with alternative strategies could lessen the local resistance to the process

of transnational developments (Marri, 2021). This shows that the policymakers are realising the importance of engagement with local people, which is indispensable for the success of the CPEC projects.

Securitised Development in Gwadar: A Cause of Disillusionment among the Locals

One reason causing discontent among the local people turned out to be the increasing presence of security forces and checkpoints which has restricted the free movement of people. Increasing security has also been politicised by the local politicians who equate this with the 'occupation' of Gwadar by Pakistan. Earlier studies predicted that the securitisation of Gwadar city will create resentment among the people (Ali, 2018). In November 2021, Maulana Hidayat Ur Rehman, a political leader led a long sit-in near the entrance to Gwadar Port. His demands included a reduction in the number of checkpoints and treating the people of Gwadar with respect at the checkpoints. Similarly, a participant also pointed out the increasing security checkpoints in Gwadar.

> "There are now security check posts everywhere on which an armed 'outsider' inquiries from the local people "who are you and where are you going". People feel afraid while crossing these check posts".

This situation makes it even more difficult for the local fishing communities to commute to their workplace. As explained earlier, some of these people were relocated by the government to other places, away from the sea due to which they found it difficult to reach the sea and fish. In other words, their source of livelihood was disturbed and their movement was restricted. The construction of the East Bay Expressway along the coast has further restricted their access to the sea. A young fisherman pointed towards this and said:

> "We are not allowed to fish near the port where more expensive fish exist. The East Bay Expressway has blocked the sea and blocked the ways leading to sea for us, we used to fish in this area, but now they have blocked it and do not even let us walk there."

Likewise, a female relocated participant elaborated on how the fisherfolk have been facing restrictions to the sea.

> "For three years now, the fishermen are facing adverse impacts of these projects, ranging from diminishing space for fishing to more restrictions on our movement in and around the sea. Ten years before, everything was great. There was a lot of freedom and fish were also in plenty."

Almost all participants pointed out the increasing security checkpoints in the city due to which the local people feel restrictions on their movement towards the sea. A fisherman explained that:

> "Security has limited our business and our main fishing harbour/jetty is being snatched from us. The proper and best timing for catching fish is 5 to 6 in the morning but they do not let us into the sea at this time. They are not from here, they do not know the timings, and they (security forces) impose their timing which is causing disruptions to our livelihood."

People are also afraid that after the completion of the East Bay Expressway, the way to Gwadar harbour/jetty will be blocked permanently, depriving the fishing communities of their main source of livelihood. Besides, as explained by one fisherman, fishing opportunities and behaviours have also been affected. Earlier people used to catch shrimp, which is expensive, but that place has been occupied by the port and now people are not allowed to catch fish there.

Talking to the local people revealed that this security-driven development process in Gwadar is an independent causal factor for the growing disillusionment of the people, in addition to development-induced displacement and other issues causing unrest among the local population.

Chinese Trawling and The Issues of Local Fishing Communities

About 70% 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.

It was also pointed out by participants that the government is planning to shift and relocate the fishing communities to the Surbandar area, away from Gwadar port. "Why should we go to Surbandar when our ancestral homes are here?" asked one fisherman, angrily. Given that the port becoming operational in which big ships will berth in the areas of fishing, the local fisherfolks were relocated from the old Mulla Band to the new Mulla temporarily where they do not have a jetty and protection breakwaters and other facilities. It looks like the fishing communities have realised that the government will soon force them to relocate for which they are already bargaining for more compensation. As a political leader told us that:

> "We know that the government will relocate us from the old jetty (it is nearby the Gwadar port) and so the government should make an alternative jetty, breakwaters for us and provide modern skills of fishing and provide markets for sale and purchase of fish."

A male political leader shared uncertainty regarding the future position of the fisher community in Gwadar:

> "The authorities took control of the old harbour and provided new harbours in Surbandar and Pishukan (two small fishing towns), but they were not as facilitated as they should have been. They have in their mind to shift the population to another place, but the concerned authorities have no proper plans for this."

To conclude, the fishing communities of Gwadar, which constitute almost 70% of the local population, have been affected the most by CPEC. Their exclusive dependence on the sea has made them vulnerable to displacement because CPEC projects have limited their access to the sea. Their sources of income are shrinking, and the Chinese trawling has almost threatened their livelihood. Some of them have been relocated, while others will be relocated sooner or later. They are the most vulnerable have will continue to be affected by CPEC projects. Hence, affirmative action is needed to protect them and their source of livelihood.

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 rumours 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 (Gawadar) 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. The locals frequently compared themselves and their condition to Lyari Town, Karachi: the people of Lyari are the original and the oldest population of Karachi. Today, they live in the most neglected and underdeveloped section of the port city of Karachi as migrants have taken the central place in the new Karachi. Lyari is more like a slum as compared to other parts of Karachi which are considerably developed. An official said,

> "The local people fear and think that these big projects are not for them, and they fear that their future will be like the original people of Lyari."

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.

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. In this section, we broadly discuss the various findings of the study to arrive at some policies recommendation.

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, such as Gwadar port and East Bay Expressway, people hardly know the names and natures of various ongoing projects. 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. At the same time, people living in the old city were found to be living under the constant fear of displacement. While some of these people will resist their relocation, our analysis shows that most people are willing to relocate voluntarily if the government provides them with enough incentives. It is because those already displaced are better off and their living conditions have apparently improved. Nevertheless, these people have shifted away from the city due to which the education of children has suffered and people have to travel long distances to find work.

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. The local products such as Gwadari halwa (sweets) have found new markets and its 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 in Gwadar. 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 district 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 need to revisit its policies and practices in Gwadar. For example, the old city is almost neglected by authorities due to which feelings of discrimination and ghettoisation have developed among the local inhabitants. Similarly, the shortage of clean drinking water and frequent electricity load shedding are issues that need immediate attention from the government. The solution to these issues will also work as a goodwill gesture toward the locals from the government which will help in regaining the confidence of the local people of Gwadar. People must be made to feel part of CPEC projects by providing them with more employment opportunities. The fishing communities are the most affected group among the local population and constitute the majority of the locals. Their rights to fishing and their access to the sea have been restricted by megaprojects. Increasing trawling by Chinese and other non-local communities has threatened the livelihood of the fishing communities. The provision of alternative sites and routes can help mitigate the feelings of suffering among poor fisherfolks. 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 GDA and other such authorities 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.

The hallmark of grounded theory is the emergence of a theory to explain the interlocking variables of the phenomenon under study. Based on the findings of the current study regarding the perspective of the local population of Gwadar regarding CPEC, we propose the following seven propositions to explain and predict how the local people feel, act, and react towards CPEC.

The direction of people's perception could either be positive or negative which depends on a few factors.

- High expectations of people from a development project ultimately lead to intense feelings of disappointment. In turn, people tend to exaggerate their issues and problems.
- If people are national-oriented and focus on the macro-level impacts of a project, their perception is mostly positive. But if they are local-oriented and focus on the micro-level, their perception is mostly negative.
- If a group of people has received some direct benefits of the projects, such as jobs, their perception is positive, otherwise negative.
- Indirect benefits of a project do not play a significant role in determining the direction of people's attitudes about a project.
- Immediate, short-term, and tangible benefits play a more significant role in determining the attitude of people.
- Prior examples /models/ precedents play a vital role in determining the thinking pattern and attitudes of local stakeholders.
- Lack of awareness regarding the nature of CPEC and its importance makes people susceptible to negative

propaganda. This knowledge gap is usually filled by vested interest groups/political leaders for their propaganda.

Elaborated examples could be found in this paper which can help the reader understand and comprehend the above-listed propositions. For the sack of repetition, we are not going to explain them again. Instead, we present the conclusion of the study and translate the seven-point theory into policy recommendations.

5. CONCLUSIONS

This qualitative study was conducted in the city of Gwadar to explore the perspectives of the local people regarding the developmental projects of the China-Pakistan Economic Corridor (CPEC). This study provided insight into the knowledge, perception, understanding, and grievances of the local people about the developmental projects of CPEC in Gwadar. The study revealed the various factors which influenced the attitude of people towards the projects and how people interpreted the impacts of CPEC projects on their lives. It is concluded that there was a communication gap between the local people and CPEC authorities/government due to which most of the local people had vague knowledge and blurred understandings of CPEC projects. The various groups of local people such as fisherfolks, micro-businessmen, local politicians, students, and government officials had different perspectives and were variously impacted by CPEC.

CPEC has changed Gwadar city and 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, mostly in the negative sense. 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. Those local communities who were relocated by the government were feeling satisfied as they were duly compensated by the government. 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.

6. POLICY IMPLICATIONS

The success of any development project depends on the cooperation and coordination of local communities living in that particular area. One of the aims of this study was to find out how the grievances and concerns of the local people might be better managed by the government and CPEC authorities. For this purpose, the study recommends the following measures that will hopefully help in mainstreaming the local people into the development process.

Employment Opportunities to the Natives

There must be a policy in place prioritising the employment rights of the locals in mega projects. The private sector should also be bound to give more employment opportunities to the locals who are currently feeling neglected. The provision of jobs to these local people will glue them with CPEC and will create a sense of belonging which is currently lacking.

Development of Fishing and Marine Life Policy

There is a dire need for a comprehensive policy for fisheries and marine life. Given that most of the local

population is dependent on fishing and given that marine life is going to be adversely affected by CPEC projects, the government must devise a policy and set out priorities for the fishery industry in Gwadar. This should include aspects such as maximising the profitability of the sector and maintaining as many fishing jobs as needed and fishery assessment to determine what level of fishing can be sustained. Specifically, the Chinese and other trawlers who pose a threat to the fish colonies in the sea must be stopped or better managed. The fishery rights of the local fisherfolk in certain specified spots of the sea must be protected by legal measures.

Special Developmental Package for the Fishing Community

Along with legislation to protect and promote the fishery sector in Gwadar, the local fishing communities that are the most vulnerable and who are considered to be the 'first causality' of CPEC projects should be given special attention. They have the right to receive tangible dividends of development. A special developmental package should include the development of alternative fishing areas along the coast, facilitation of fish marketing, provision of advanced fishing machinery and training, alternative employment opportunities, and attractive relocation packages in case of displacement.

Drinking Water and Electricity Supply

Lack of drinking water and electricity were pointed out by participants as their most pressing issues. Almost all groups interviewed for this study raised these two problems, among others. Both of these issues were also personally felt by us while collecting data in Gwadar. The increasing population of the city will further aggravate these issues, leading to a feeling of neglect among the locals. Proper arrangements for the provision of these two facilities will greatly help in reducing the ill-feeling among the locals. Besides, the provision of these facilities will also help in the promotion of a conducive environment for attracting tourists and investors to Gwadar.

Skill Training and Promotion of SME

As per the findings of this study, the local people of Gwadar lack appropriate skills and attitudes due to which they are not deemed fit for employment in various projects. Their traditional skills cannot compete with the highly skilled workers from outside Gwadar. In order to make them more competitive, the government should arrange skill development training and promote small and medium enterprises for the local people. There is a skill development centre being constructed in Gwadar, but more diversified measures are required to increase the employability skills of the local people.

Engaging and Educating the Locals on the Natures and Purpose of CPEC Projects

There seems to be a communication gap between the local people and the CPEC authorities/ government. Common people mostly do not know what is going on, due to which they find CPEC unrelated to their lives. Lack of information also makes the local people more susceptible to negative propaganda against CPEC by political and anti-state elements. Efforts must be made to engage the people in CPEC by increasing the awareness of the locals about the purpose, nature, and potential benefits of various projects. A "community engagement/public relations wing" can be introduced in the CPEC authority for the sole purpose of public engagement and countering propaganda against CPEC.

Ensuring Development of Locals Population through Corporate Social Responsibility

Lastly, the concept of corporate social responsibility (CSR) must be invoked more vigorously in Gwadar. All corporate groups should be bound to engage in the social welfare of the local people. For example, the big real estate business groups/ housing societies working in Gwadar can be asked to provide some services (e.g., street pavement) for the local areas as well. A proper policy should be developed to channel the CSR fund more systematically.

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EXPLORING THE WATER GOVERNANCE POLICY FRAMEWORK FOR IMPROVING PARTICIPATORY IRRIGATION MANAGEMENT REFORMS

Muhammad Arfan

ABSTRACT

Participatory Irrigation Management (PIM) reforms were introduced to mitigate the inept management of the traditional irrigation bureaucracy. It was hypothesized that these reforms would positively impact crop productivity and enhance the distributional equity of water among its users. The present study compared the PIM and Non-PIM irrigation schemes under almost the same cropping systems in Pakistan's Sindh and Punjab provinces—linking it to farm sizes, management practices, institutional arrangements, and governance structures. Both qualitative and quantitative research methods were used for studying different aspects of irrigation management and the reform process. The study concludes that economic inequity is a consequence of canal water distributional inequity. Spatially, users along the canal tail significantly underperform compared to the actual potential. PIM reforms were unable to generate hydro-solidarity between head and tail sections of the canal and, thus, farmer-managed institutions — FOs and AWBs – were unable to check the rent-seeking behaviour of irrigation bureaucracy. The level of participation in WUAs activities does not have a significant impact on the farm level productivity, but the Institutional Performance of AWBs (IPAWB) has a significant positive impact on the Composite Irrigation Management Performance (CIMP). Community cooperation and WUAs' maturity have a significant positive impact on community participation in WUAs' activities. Moreover, land asymmetry has a significant negative relationship with land productivity, CIMP, IPAWB, and the level of participation in WUAs activities. It has also been seen that irrigation bureaucracy only does institutional mimicry under externally assisted push because there is substantial evidence that the PIM model was never adequately tested and implemented. Under such circumstances, reform cannot generate hydro-solidarity, trust, and collective action from below. We argue that without active farmers' agency—small and landless peasants – these paper organisations cannot create multi-level accountability in irrigation management. We point out an important but under-theorized factor contributing to these failures: depoliticized irrigation management transfer processes that fail to redistribute social power. Donor articulations of the PIM "theory of change" do not make explicit that a shift in social power – not just management authority and responsibility – is necessary.

1. INTRODUCTION

After the downfall of the Union of Soviet Socialist Republics (USSR), an era of Keynesian economic policy started fading during the 1980s (Townsend, 2004; Wolff & Resnick, 2012). The political economy of the world was dramatically transformed by neoliberal restructuring (Robinson, 2000), which redefined state responsibilities and economic processes (M. Wilder & Romero Lankao, 2006). This phenomenon is also termed Thatcherism (Hall & Jacques, 1983), with decentralisation of state institutions as one of its salient features leading to strong localized municipalities, private corporations, and user associations (Ahlers, 2010; M. Wilder & Romero Lankao, 2006). The role of the state as the sole driver of development and operations weakened (Azeem, 2020; M. Wilder & Romero Lankao, 2006).

In 1988, Pakistan's political regime change came with the idea of privatisation and decentralisation of state institutions (Ramanadham & Bokhari, 2019). The external push of funding institutions, such as the World Bank (WB) and Asian Development Bank (ADB), also influenced this restructuring (Kemal, 1995). Proponents of this idea advocated restructuring of state institutions as a noble rationale to improve services, resource equity, stakeholder participation, empowerment of local communities, democratizing local peasantry, financial sustainability, and overall good governance (Larson, 2002). During the 19th century, "hydraulic missions" initiated global colonisation, both internally and externally. International financing institutions invested in large-scale infrastructure with special emphasis on developing countries.

After the Mexico water reform experience, the World Bank revised its previous strategy of "rehabilitate first, then transfer" to a new strategy of "transfer first, then rehabilitate" (M. Wilder & Romero Lankao, 2006). The irrigation bureaucracy of Pakistan saw it as an advantage to get the World Bank loan for introducing Participatory Irrigation Management (PIM) reforms in 1995 (Briscoe, Qamar, Contijoch, Amir, & Blackmore, 2005). This participatory reform package was introduced in the Indus Basin Irrigation System (IBIS) on selected canals parallel with the traditional working of the provincial irrigation departments. Provincial Irrigation and Drainage Authorities (PIDAs) were established in 1997, and the management of selected canals was transferred to newly established farmer organisations (FOs). It was argued that this reform package enables efficient services through localised self-management of farmer organisations (FOs) (Shah, Hussain, & Saeed-ur-Rehman, 2000). It was also assumed that localised self-management improves the distributional equity of water among its user, enables collective action, enhances the trust and solidarity between head and tail reach, enhances financial self-sufficiency by reducing the financial burden in the shape of a massive amount of subsidy to irrigation departments, and improves the overall livelihood of the community (Lin Crase, Vasant Gandhi, Bashir Ahmed, Bakhshal Lashari, Muhammad Ashfaq, 2020).

During the last two decades, since the reforms were introduced, Sindh has introduced two amendments. The first amendment was to change the Sindh Irrigation and Drainage Authority (SIDA) act 1997 to Sindh Water Management Ordinance (SWMO) 2002 and the Sindh Water Management (Amendment) Act 2005. However, Punjab has only tinkered with Punjab Irrigation and Drainage Authority (PIDA) act 1997 and has trimmed the participatory reform scope to Punjab Khal Panchayat Act 2019 (Memon, Cooper, & Wheeler, 2019). Recently, Sindh, after a consultative engagement with a civil society organisation, Strengthening Participatory Organisation (SPO), and a collaboration with the Commission on the Status of Women in Sindh (CSWS), proposed a new amendment to ensure women's participation in different tiers of nested governance structure (as shown in Fig 1).

The literature on participatory reform in Pakistan can be categorised into three strands: (1) reform outputs without the critical engagement with the local issues; (2) realizing the reform implementation challenges but only focusing on one reform player as a villain (i.e., irrigation bureaucracy or farmers' agency); and (3) navigate between irrigation bureaucracy and development donor without engaging with policy problem critically. We attempted to critically engage with the reform process and look into the existing implementation challenges and how the issues associated with bureaucratic hurdles, community inefficacy, and donor participatory development approach reproduce each other in the reform process.

This working paper explores the participatory irrigation management reforms in Pakistan and answers the following research questions systematically:

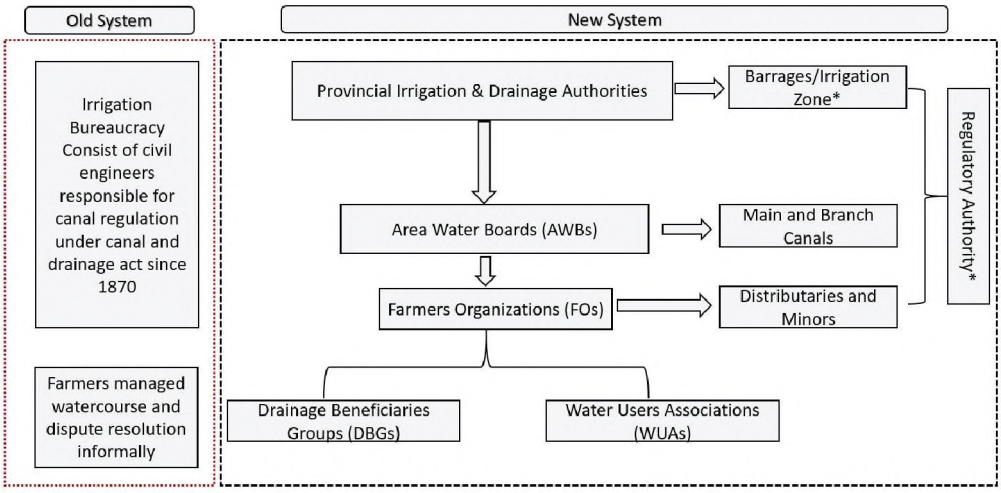
- How does the reform impact the distributional equity of the system compared to the non-reform area?
- Is the reform able to enhance agricultural productivity compared to the non-reform area?
- If there is a difference between agricultural productivity, is it associated with community and institutional characteristics?
- What sort of resource user and resource characteristics play a role in the collective action of the community?
- What challenges did the PIM reform face after its implementation globally and locally?

This paper is organized into five sections. The introduction section presents Pakistan's irrigation sector and a critical discussion of the relevant literature on neoliberal assumptions and arguments underlying water reforms in the developing world, the main components of Pakistan's water reform program, and the influence of international organisations. The method section describes the study area and the materials used in this study for each research question. The results section summarizes the key findings of each research question studied. The final section discusses the outcomes of the decentralisation of Pakistan's water sector and explores the implications and conclusions of our research.

Irrigation Water Management and Governance in IBIS

During the colonial era, supply-side solutions were offered to address water scarcity, which included large dams, barrages/headwork, and canals (Yu et al., 2013). Irrigation bureaucracy and professionals were trained to manage this large-scale irrigation infrastructure. IBIS, one of the largest contagious irrigation systems, is, hence, a supply-driven irrigation system that typically diverts water from barrage/headworks to main canals, main canals feed branch canals, and branch canals feed tertiary level irrigation system, termed as distributary/minor. Further distributary and minor diverted water to an outlet is applied predominantly through surface irrigation, i.e, the flooding technique. This irrigation structure is governed through a nested framework and it is exclusively managed by the irrigation department up to the tertiary tier. Only below the tertiary tier, watercourses are managed by the community. Water is delivered through a unique system of warabandi in IBIS, which allocates water for a given time to each field of every watercourse on a pro-rata basis, with the area also termed as water allowance. Once water is drained from the outlet, it is distributed among fields sequentially according to the warabandi schedule (known as Pacca Warabandi).

Figure 1. Comparison of Centralized Irrigation Department with Participatory Reform



During the watercourse lining program, informal community organisation was first organized into Water User Association/Water Course Associations to implement the watercourse lining program (managed under the agriculture department) (Byrnes, 1992). These WUA/WCA provided manual labour and a certain amount of financial share (which varied from time to time) to contribute financially. After that experience, the World Bank further pushed the authorities to give these community organisations more organisational space up to the tertiary and secondary levels.

International Context of the Reform

In a policy paper of the WB 1992, the Bank describes three priority areas for future water management as main pillars: water as an economic good, improved institutional arrangement involving greater stakeholder participation, private sector, and NGOs, and comprehensive management of water (Briscoe, Anguita, & Peña, 1998). International Conference on Water and Environment held in 1992, a.k.a. Dublin Conference, concluded: “water has an economic value in all its competing uses and should be recognized as an economic good” (Lundquist, 1997). Following the Dublin principles, the United Nations Conference on Environment and Development (1992) also endorsed the idea of water as an economic good (Gleick, Wolff, Chalecki, & Reyes, 2002).

Therefore, the participatory introduction of the institutional reform in Pakistan was interlinked with the reform's international context and streamlined with the neoliberal economic agenda of water reforms and decentralized governance. Many developing countries adopted these reforms under the Bank's guidance and funding (Liebrand, 2019; Santiso, 2001; D. L. Vermillion, 1997). Third-world countries with economic dependence on the Bank's lending face severe financial indebtedness challenges (Santiso, 2001). The state's functioning and performance in service provision and developmental activities were questioned. Under these circumstances, market forces and the private sector were portrayed as the “only” compelling alternative to government, and the state was claimed to be inefficient (Desmond McNeill, 1998). The "only" option left behind included the water users and other private sectors in water management as an integral part of an alternative form of participatory water governance movement (M. O. Wilder, 2002). This alternative decentralized governance was believed to improve "resource allocation, efficiency, accountability, and equity". Water pricing and participatory governance were considered as means to achieve the goals mentioned above. After its widespread adoption, the "new" decentralized governance provides a tremendous body of literature highlighting its impacts and outcomes. The literature discusses different strategies of decentralisation in different countries and contexts (Bandyopadhyay, Shyamsundar, & Xie, 2010; Ghumman, Ahmad, Hashmi, & Khan, 2014; Mukherji, Fuleki, Suhardiman, & Giordano, 2009; Parthasarathy, 2000; Raby, 2000; Reddy & Reddy, 2005; Senanayake, Mukherji, & Giordano, 2015; Sinclair, Kumnerdpet, & Moyer, 2013; Suhardiman, Giordano, Rap, & Wegerich, 2014; Uysal & Atiş, 2010; Douglas L Vermillion, Samad, Pusposutardjo, & Arif, 1999).

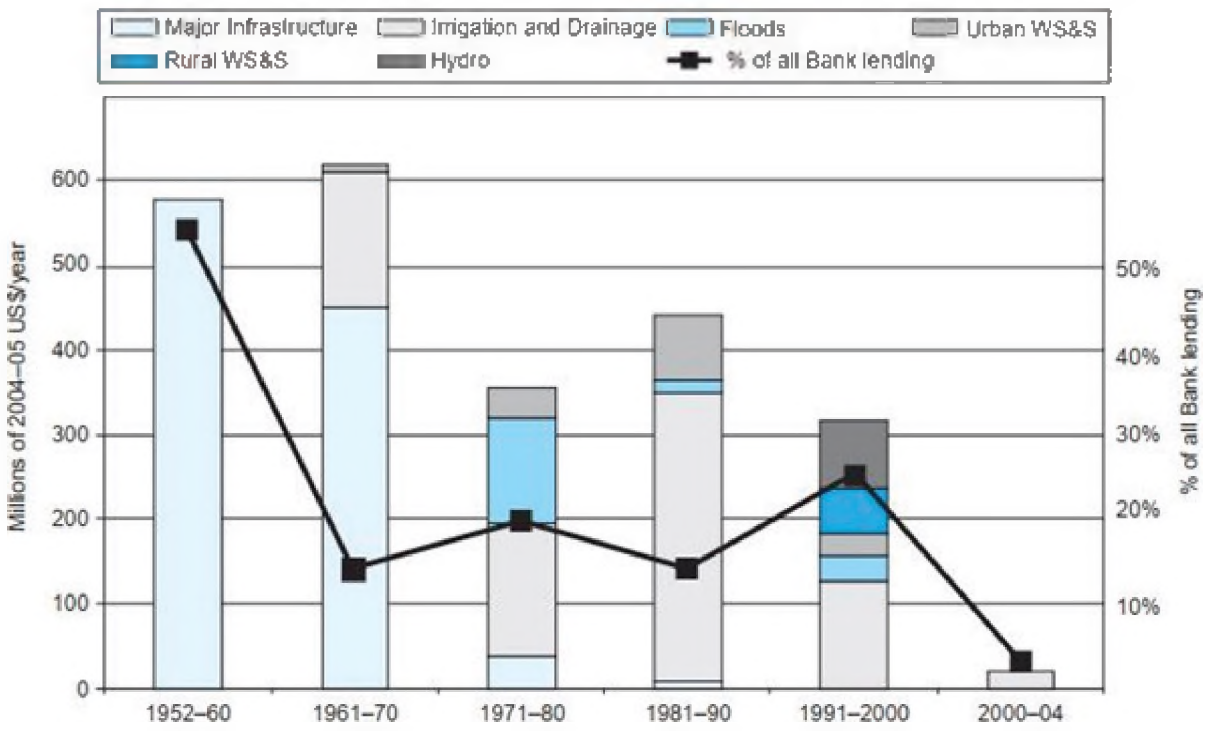
Political Economy Context of Reform

Pakistan’s water reform program was merged (both chronologically and ideologically) with a neoliberal economic transformation that began to take shape in the late 1980s, accompanied by a political opening that resulted in the election of Benazir Bhutto – leader of the leading opposition alliance called Movement for Restoration of Democracy (MRD) – as the first women prime minister of Pakistan in December 1988. Bhutto's

victory was widely celebrated and interpreted as a democratic transition after the 11-year rule of General Zia. During the election campaign in 1988, Benazir Bhutto had promised the industrial sector to end the nationalisation policy and carry out industrialisation by means other than state intervention. Later, a massive privatisation plan was unveiled on 22 January 1991 by Prime Minister Nawaz Sharif, inspired by the success of the privatisation agenda introduced by British Prime Minister Margret Thatcher. Pakistan’s economic opening was also demonstrated by its 1995 participation in the General Agreement on Tariffs and Trade (GATT) (Noshab, 2000).

The World Bank has had a long history of lending to Pakistan's water sector since the Indus Water Treaty (1960). Figure 2 shows the Bank's lending in Pakistan's water sector. Initially, this lending focused on infrastructure development, and then in the 1980s, its focus shifted from infrastructure development to transforming the institution. In 1994, the Bank studied the water sector and prepared a report titled, "Pakistan—Irrigation, and Drainage: Issues and Options". This report points out that in Pakistan, as in many other countries, the government treats irrigation water as a public good, whereas it is a private tradable good, for which markets can operate (Briscoe & Qamar, 2005).

Figure 2. World Bank lending to Pakistan for water-related sectors (1952–2004)



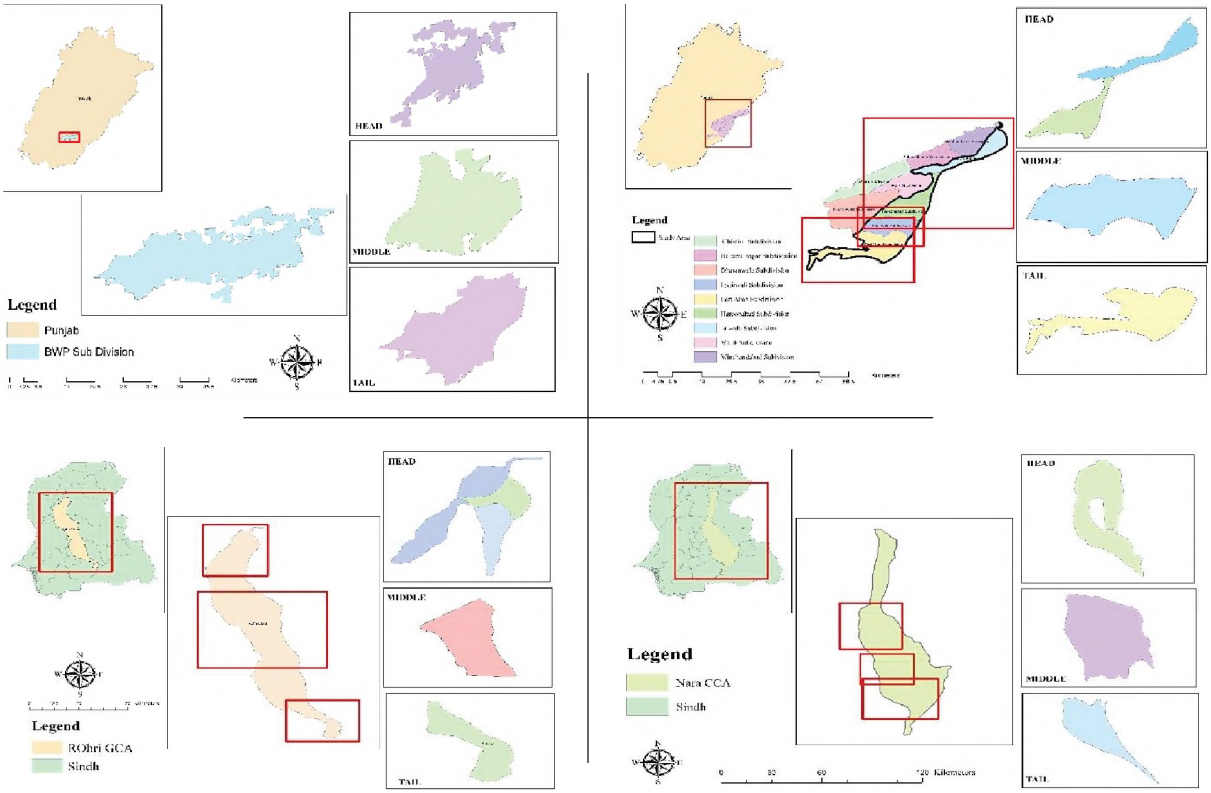
Source: The World Bank, 2004

2. MATERIALS AND METHODS

Reform and Non-Reform Area Canals' Description

Canal command areas of Punjab and Sindh were selected for this study. Two canals from each province were studied for comparative analysis of the reform. One was the area where the participatory governance regime is/was practised, and the one which only the provincial irrigation department manages. For this purpose, Bahawalpur and Bahawalnagar canal circles are selected in Punjab due to almost similar geophysical and climatic characteristics. Bahawalpur and Bahawalnagar are situated in the princely state of Bahawalpur. The Nawab of Bahawalpur designed the Sutlej Valley project with the help of the British on the Sutlej River. Canals were selected in Sindh (Rohri and Nara) due to their geophysical and climatic characteristics. Both these canals are on the left bank of the Indus River. Rohri canal command has some comparative advantage due to its alignment with the Indus River floodplain areas in some sections. The dominant crops in these canal areas are wheat and cotton. Each main canal system was divided into three sections, i.e., head, middle, and tail to understand the spatial irrigation system performance, as shown in Figure 3.

Figure 3. Study Area Canal selected



The Punjab irrigation network has shown the head Suleimanki and Islam command area (Upper Left and Right). Head Suleimanki command area, where the PIM reform was introduced, whereas head Islam command area under provincial irrigation department of Punjab. The Sindh irrigation network has shown the Nara and Rohri command area (Below Left and Right). Nara command area, where the PIM reform was introduced, whereas Rohri command area under the provincial irrigation department of Sindh.

Methodology for Each Research Question

Comparative Analysis of Irrigation Governance under PIM and Non-PIM Irrigation Schemes

Remote Sensing-based Irrigation Performance Indicators

Remote sensing data is widely used to assess water use performance indicators globally, and this robust method assists resource managers in effectively deciding the water allocation rules and decisions temporally and spatially. Remote sensing-based Normalized Difference Vegetation Index (NDVI), actual evapotranspiration, and evaporative fraction provide a better understanding of the real-time performance of different irrigation schemes and their water delivery system. In this study, we estimate the time series of cropping intensity, adequacy, reliability, and economic water productivity based on remote sensing time series data, in addition to the traditional survey-based estimates.

The single-source energy balance model called SEBAL was used to estimate the actual evapotranspiration. It is a well-tested and widely-used method for the computation of the actual ET (Allen et al., 2007; Wilhelmus Gerardus Maria Bastiaanssen, 1995; Wim G M Bastiaanssen, Menenti, Feddes, & Holtslag, 1998; Glenn et al., 2011; Jia, Wu, Tian, Zeng, & Li, 2011; Liou & Kar, 2014). SEBAL is a direct empirical method that incorporates energy balance using some land surface properties such as albedo, net radiation, canopy cover, surface temperature, and leaf area index. The surface energy balance equation gives the principle of ET estimation by remote sensing.

$Rn=LE+H+G$

where Rn is the net radiation, LE is the latent heat exchanges, H is the sensible heat, and G is the soil heat flux
The use of energy balance can help detect the reduction in ET caused by water shortage. Different models can improve the accuracy of the ET estimations from this method. However, these models are accurate if their interpolation and calibration are correctly done at the local level. For this study, the cloud-free scenes from MODIS were downloaded from USGS earth explorer from Jan 2015 to Dec 2021. The average seasonal actual ET was estimated for each Rabi and Kharif season during this period.

Land Use/Land Cover Classification Change

Eight LULC classes: banana, cotton, rice, sugarcane, fallow land, water bodies, built-up, and mango were achieved after classification. The producers' and users' accuracy for different classes are shown in Table 4.3. The overall accuracy for the Rohri and the Nara canal command is 93% and 95%, respectively. The kappa coefficient value is more than 90% for both the canal command, which is considered a good classification category. The built and water bodies have high separability. The mango and banana fields were easier to categorize because they were large, frequent, and more separable from the other classes. The water bodies and rice cells were difficult to separate due to their low NDVI values. Similarly, fallow land and cotton fields also had the same reflectance range.

Performance Indicators

Different performance indicators were used for the comparative analysis of the selected PIM and non-PIM canal command areas. The purpose of using comparative indicators is to assess outputs and impacts of intervention in distinct systems, compare the performance of a system over time, and also allow comparison of systems in different areas and at different systems at spatial scales (Molden, Sakthivadivel, Perry, De Fraiture, & Kloezen, 1998). Performance indicators help identify the differences in performance at the scheme level, seasons, and irrigation sources (wim H. Kloezen, 1998). It also helps to find out the gaps in management policies. Contrary to process indicators, performance indicators were not data-intensive and cost-effective (wim H. Kloezen, 1998). Considering the complication of the process indicators and their estimation, we prefered to use comparative performance indicators proposed by IWMI (Molden et al., 1998). These performance indicators are best-suited and applied at different scales cited in the literature (Cuamba, 2016; DEĞİRMENCİ, Büyükcangaz, & KUŞCU, 2003; Efriem & Mekonen, 2017; Hasan Merdun & ., 2004; Kloezen, Garcés-Restrepo, & Johnson III, 1997; Murray-Rust & Snellen, 1993; P. S. Rao & Rao, 1993; D. L. Vermillion, 1997). A basic illustration of the selected performance indicators is listed below.

Cropping Intensity (CI %) = Actual Cropped Area/Gross Command Area

Adequacy of Canal Water Supplies = Average Seasonal Evaporative Fraction

Reliability of Canal Water Supplies = Coefficient of Variation (CV) of Evaporative Fraction

Head to Tail Ratio CI = CI of Head Command Area/ CI of Tail Command Area

Water Productivity (Rs/m3) = Gross Return/Actual Evapotranspiration (ETact)

Gini Coefficient of Agricultural land productivity

Output per Unit of Command Area (Rs/acre) = Net Return/Command Area Irrigated

Studying the Resource and Resource users' Characteristics

Mixed Methods Design

We used both quantitative and qualitative methodologies and primary and secondary data to generate a more holistic picture of the system, according to the complexity of the research issue and hypotheses. Structured watercourse (WC) interview survey of the representatives of farmers from Watercourse Associations (WCA/WUA) on canals where PIM reform was introduced and general farmers where the irrigation department

managed the canal regulation was carried out. Semi-structured interviews with key informants from the Sindh Irrigation and Drainage Authority (SIDA) and Punjab Khal Panchayat Authority (previously worked as PIDA), the Irrigation Department (ID), farmer's organisation chairman, and water experts currently affiliated with neither SIDA nor the ID, and focus group discussions with sharecroppers, farmers from marginalized communities were among the mixed methods used. The purpose of key informant interviews and focus group discussions was to gain a better and holistic understanding of the underlying features of the irrigation system so that the survey findings could be better interpreted.

Sampling Design and Data Collection

Three distributaries were selected in each canal command area in Sindh and Punjab. Hence, 12 distributaries were surveyed, with four each at the head, middle, and tail reach. The sample size targeted 600, 300 in Sindh, and 300 in Punjab. A total of eight focus group discussions (FGDs) were conducted, one from each canal's distributary head and tail reach. A total of 25 key informants were selected.

Survey Tool Design

The survey instrument was developed using ideas and specific question examples from the literature on community cooperation and collective action, group dynamic effectiveness, technical rationality of irrigation infrastructure, irrigation management performance, community participation in participatory institutions, and the PIDA farmer's organisation assessment evaluation scale. Furthermore, the principal investigator's theoretical and contextual understanding and his field experience as an enumerator aided in the refinement of several scale items.

Pretesting

The survey was pretested with many Nara canal AWB Farmers' Organisation members who were not among the participants in the main survey poll. The survey instrument was further refined throughout the pretesting phase to eliminate ambiguous questions, resolve conceptual ambiguity, convert certain open-ended questions to closed-ended questions, and reorganize the question order to improve flow. A few more questions were added to the research study that were in keeping with the tone and goal. Members of the field crew were also able to evaluate time and give suggestions for making the survey more efficient during pre-testing. The survey tool used in the PIM and non-PIM areas was slightly different due to different governance regimes, and some scale and scale items were not relevant to their context, so this adjustment was made in the survey tool for data collection in the Non-PIM area. The final survey instrument in English is given in Annex 2.

Sampling Design

The sampling design was based on the subdivision selected for remote sensing analysis, and one distributary was selected from each head, middle, and tail of each main canal in the Punjab and Sindh. We targeted 50 respondents from each distributary at the head, middle, and tail, giving us a total sample size of 600. However, the targeted sample size achieved was 550 and after cleaning, the sample size used in the analysis was 457. The exact number of valid sample sizes for each canal is presented in an annexure or a table.

Data Analysis Framework

Hierarchical Regression

Hierarchical regression is an alternative approach to stepwise regression. It can be used to assess the contributions of variables other than the already known variables, as a statistical control method, and to investigate incremental validity. Hierarchical regression, like stepwise regression, is a sequential method that involves the progressive introduction of predictor variables into the analysis. In contrast to stepwise regression, the order in which variables enter into the analysis is determined by theory(Lewis, 2007). Rather than allowing a computer software program to "select" the sequence in which the variables are entered, the researcher makes

these decisions based on theoretical knowledge and already available evidence about the problem. While there is no "correct" method for choosing the order of variable entry in the stepwise versus hierarchical Regression, (Kerlinger, 1966) noted that "no substitute for depth of knowledge of the research problem... the research problem and the theory behind the problem should determine the order of variable entry in multiple regression analysis" (p. 545). Mechanical model selection and modification processes... often cannot compensate for deficiencies in the data and are no replacement for judgment and intellect" (Fox, 2019). Simply put, "the data analyst understands more than the computer" (Henderson & Velleman, 1981, p.391).

When the variation on a criterion variable is explained by predictor variables associated with each other, hierarchical regression is an acceptable method for analysis (Pedhazur, 1997). Hierarchical regression is a good option because correlated variables are prominent in social science research. After adjusting for other factors, hierarchical regression is a popular approach for analyzing the influence of a predictor variable. This "control" is performed by measuring the change in adjusted R2 at each analysis stage, thereby accounting for the increase in variance after each set of variables is introduced into the regression model (Pedhazur, 1997).

PIM Agenda Implementation in Theory and Practice

For studying PIM agenda implementation in theory and practice, we looked at case studies from different continents, identified the key theme to review the global case studies, identified the key challenges PIM faced, and compared those with our case study. We selected seven case studies across different continents, did an extensive literature review, and, finally, analyzed the published available evidence about the selected themes. The theme that we have selected for framework analysis covers the context of the irrigation system, features of the hydraulic bureaucracy (an institutional feature of the reform model), external and internal drivers for reform, farmers' politics for reform, the consultation process, the role of the lending agency, and how and what sort of rules and regulation devised for power shift from irrigation bureaucracy to a community organisation. Meanwhile, we used our insight from the field observation and key informant interviews with stakeholders involved in the reform process for our case study to understand the PIM reform implementation challenges in our context.

Focus Group Discussion

Members of vulnerable/disadvantaged groups – especially tenant farmers – participated in focus group talks to acquire a broader perspective on the issues of attaining water distribution equality. These conversations were exploratory and intended to aid in interpreting evidence acquired through other means rather than directly informing the hypothesis.

Key Informant Interviews

Individuals with experience and knowledge about irrigation management in Sindh and the Punjab were requested for interviews. A total of 25 key informant interviews were conducted. The goal of these interviews was to get a high level of understanding of the obstacles to implementing participatory irrigation management and get insights that would aid in interpreting survey data. All-important informants were found through the personal network. Since these interviews were intended to be semi-structured, customized interview guidelines were created according to the context of each category of the key informant (see Annexure D).

Participants in the first category were (SIDA/PKPA (EX-PIDA) personnel who are directly involved in the social mobilisation and capacity development efforts of FOs. The second category consisted of existing Irrigation Department personnel, responsible for the distributary and subdivision level canal regulation and mandated to work in close coordination with FOs. Former and current FO chairman for different distributaries made up the third category. They were asked to specifically speak about their experience in FO's activities and how different stakeholder expectations and responsibilities were moderated by them, and what kind of key challenges did they face during their tenure. The interviews were audiotaped with permission and specifically asked whether the information they provided could be used as "on-record" or not.

3. RESULTS AND DISCUSSION

Comparative Analysis of Irrigation Governance under PIM and Non-PIM Irrigation Schemes

Comparative performance analysis of different canal irrigation schemes is a way to improve canal or basin-scale water regulation. Since the 19th century, after the scaling up of irrigation schemes, a wide range of literature has been produced to measure these irrigation schemes, productivity, and efficiency in many ways. Hence, to assess the productivity and efficiency of these irrigation schemes, different indicators/indices were designed based on the nature of data availability. Initially, these performance indices methodologies relied on traditional survey approaches and canal-level data measurement through a rating scale. These data collection methods' accuracy was compromised under different conditions and contexts. Water resource specialists came up with different ways where this data scarcity and collection-related subjective biases could be minimized objectively.

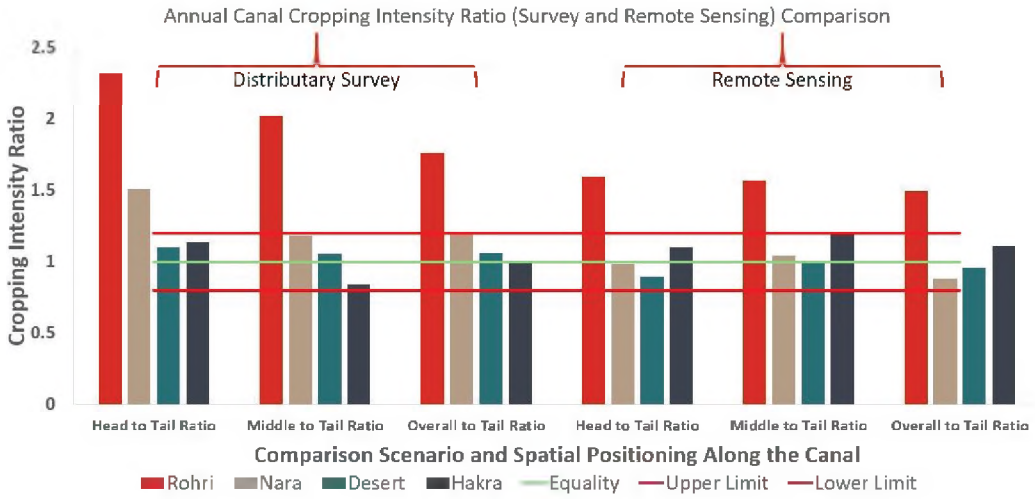
After advancements in remote sensing techniques and free access to better temporal and spatial resolution scale remote sensing data, the use of these datasets became popular among researchers to better assist traditional data collection methods. Different irrigation schemes' performance can be compared from different perspectives, like distributional equity, efficiency in resource use, and environmental sustainability. In this section, our focus remains on distributional equity, and its consequences resulting in agricultural economic return inequity. In the following section, we discuss section-wise results.

Cropping Intensity Comparison

Annual cropping intensity was estimated through crop reported in a distributary level main survey and remote sensing approach using NDVI as a proxy indicator to estimate the overall area under crop in each season. Remote sensing analysis was performed at the subdivision scale, whereas in the main survey, we selected the distributary in each subdivision. To compare canal performance, we estimated the cropping intensity ratios at three scales, i.e., head-to-tail, middle-to-tail ratio, and overall-to-tail ratio, and compared the canals from the equality lens. A cropping intensity ratio indicator equal to one means perfect equity. However, if the value is greater than one, it means the head section is a more cropped area as compared to the tail section. Similarly, if the value is less than one then the tail section is a more cropped area as compared to the head section. Head-to-tail inequality in the canal system largely has two reasons. The first is a technical reason. As the canal approaches the tail, its system losses increase, which ultimately negatively impacts the tail section, generally termed as inequality due to the canal system, i.e., hardware problem. The second reason is the mismanagement of the canal schedule favouring the head/tail section or any targeted area. It is generally termed the software problem (Power Asymmetry) of the canal system. Keeping the above scenario in mind, we used a 20% plus/minus uncertainty level as a permissible limit.

Data analysis suggests that the Rohri canal has more inequity between head and tail reaches than the Nara Canal area in Sindh. In the Punjab, the difference in cropping intensity between head and tail reaches remained largely within the permissible limits. The reason for this apparent equality relies on the conjunctive use of the saline and marginally fresh groundwater at the head, middle, and tail sections of the canal. We analyzed the estimated evaporative fraction data to validate these initial findings further.

Figure 4. Comparison of cropping intensity estimated at distributary and sub-division scale

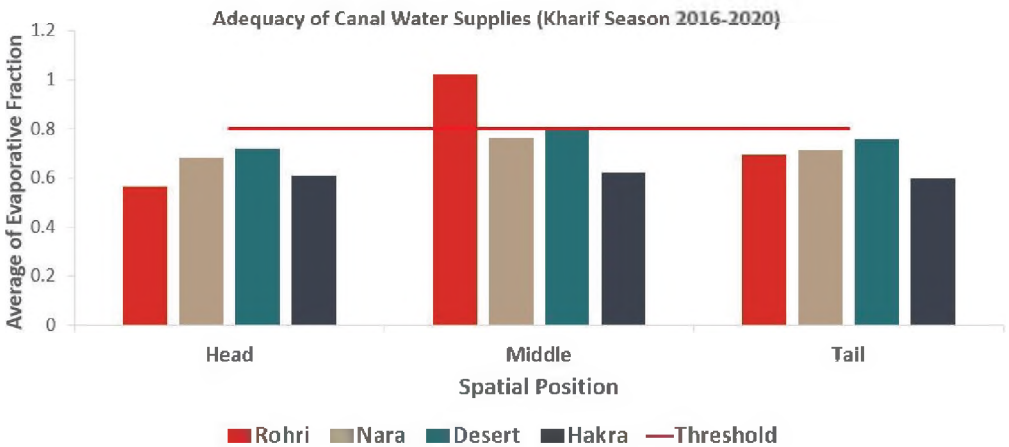


Adequacy and Reliability of Water Supplies

Figure 5 provides (see the table in Annexure E) the adequacy of the canal water supplies in the selected canal command area and the canal system's spatial position. Adequacy is defined in this study as the average seasonal evaporative fraction, and reliability is the temporal variability or the temporal coefficient of variation of the evaporative fraction across a season. Evaporative fraction levels of 0.8 or greater suggest little stress, whereas values below 0.8 indicate increased moisture scarcity due to insufficient water supply. Similarly, lower coefficients of variation indicate a more consistent water supply throughout the growing season (Ahmad, Turral, & Nazeer, 2009).

A comparison of the evaporative fraction for the selected canals shows the seasonal variation of the canal water supplies in each respective command area. During the rabi season, over-allocated canal water from the wheat crop demand, and during the Kharif season, it marginally meets the crop water requirement of the cotton crop. The head, middle, and tail reach variation showed that canal regulation is inadequate and unreliable, and Kharif season water scarcity is easily managed through an existing available water resource with better canal regulation. In the Nara canal, the rabi season canal regulation seems much better than other canal commands simply because the Nara canal has a Chotiari reservoir facility for managing the regulation in a better manner. The length of our canal system is so long that once the water diverts from the source to the canal, there is no storage facility available in the canal system where the water can be stored if it is not needed at the field. During the field investigation, farmers reported this seasonal inadequacy of canal supplies as shown in Figure 6. The investigation showed that due to the over-irrigation of the wheat crop, the wheat yield was hampered.

Figure 5. Adequacy of Canal Water Supply in Kharif and Rabi Season



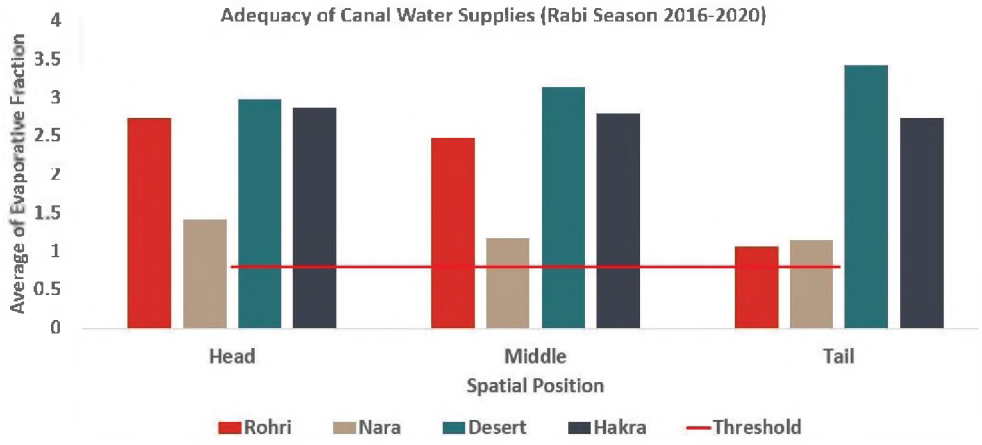
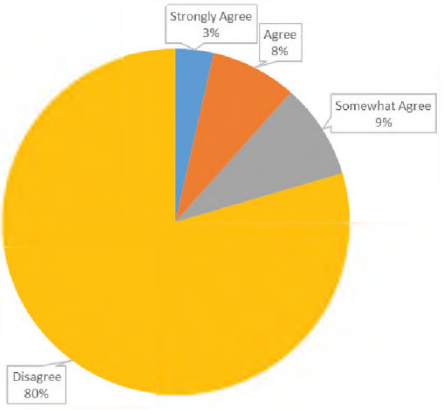
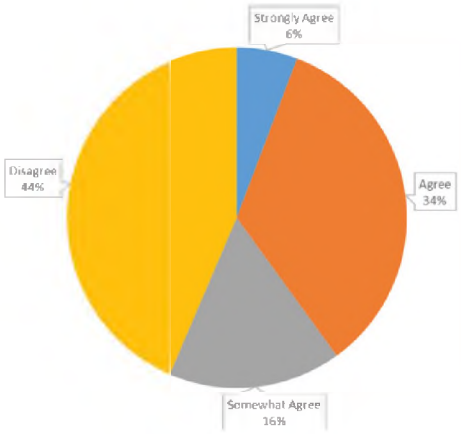


Figure 6a. Adequacy and Reliability in Kharif Season (Farmers Reported)

Figure 6b. Adequacy and Reliability in Rabi Season (Farmers Reported)





Farmers adapted to this inadequacy by changing the crop choices to annual crops such as sugarcane and banana (in the case of Sindh), especially in the head and middle reaches. This shifting of crop choices in head and middle reaches due to enough availability of canal supplies indicates huge crises for the tail area in the early Kharif season. Hence, the late sowing of cotton crops reduces the cotton crop yield too. The difference in canal water adequacy and reliability between head, middle, and tail reaches was more significant in Sindh canals than in Punjab canals, as shown in Figure 5.

The foremost explanation for this phenomenon is simply the less variation in the selection of high delta crops in Punjab canals. We observed that the adequacy and reliability difference between head and tail in Punjab is much better than that of Sindh. Can we conclude that canal water distribution in Punjab is equitable as there is less variation between the head and tail reaches of the canal? We hypothesize that the apparent equity in cropping intensity and canal water adequacy/reliability between head-to-tail sections is primarily due to groundwater use. However, this adaptation strategy does not provide an equal agricultural economic return. To validate the above-stated hypothesis, we analyzed the land use and land cover classification, and the main distributary level survey-reported agricultural return.

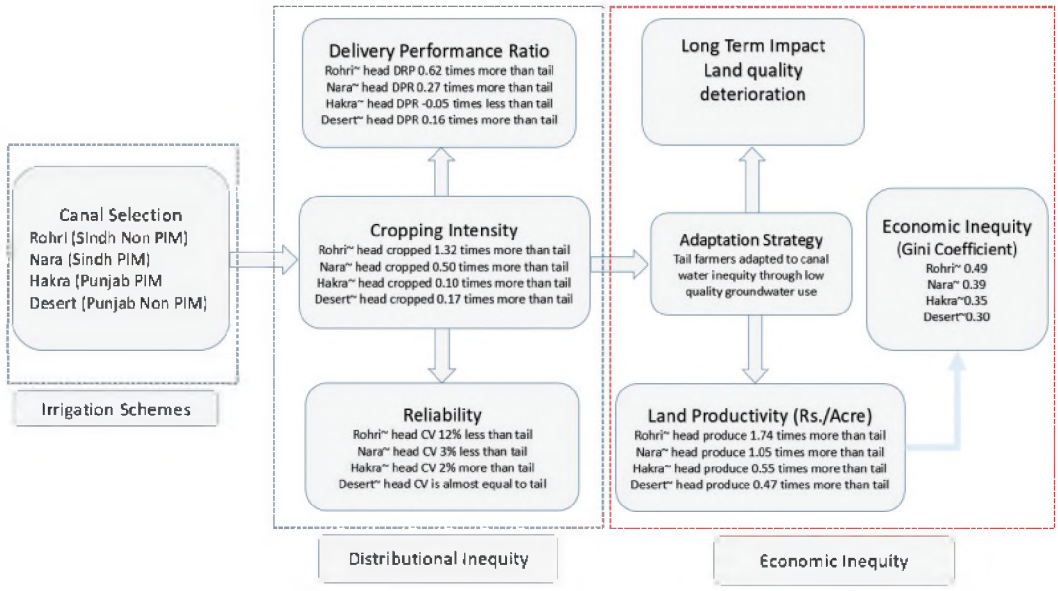
LULC classification reveals that the overall area under cotton crop decreases in both canal command areas of Sindh, with the rate of change in acreage in the cotton crop being 8.7% and 7.7% in Nara and Rohri canal command areas, respectively. The high delta crops were more visible along the head of the canal network, and as the spatial distance from the main or branch canal increased, the proportion of high delta crops decreased significantly. The variation in the crop choices for the head section ultimately influenced the low cropping intensity at the tail reaches of the canal system. This situation showed another form of inequity between the head and tail sections. This inequity led to an economic inequity between the head and tail reaches of the canal system and was estimated as the Gini coefficient.

Water Inequity leads to Economic Inequity

In the previous section, we analysed different indicators to assess the distributional equity between head and tail sections in different canal systems. Figure 7 provides an overall summary of this section that shows how the land and water productivity estimates per unit and cubic meter of water used differ between the head and tail reaches.

We estimated the annual gross return and net return (Rs) from the crop production survey at the distributary level. The comparison of the gross and net returns of land productivity (Rs/Acre) shows that the overall desert canal had the highest gross and net returns compared to the other three canals. The head, middle, and tail reach canal comparison show that the Rohri canal middle section had the highest gross return, and the desert canal had the highest net return at the head section. From an equity perspective, Rohri and Nara canals have more variation between head, middle, and tail reaches than the Desert and Hakra canals. Hakra canal has a better annual cropping intensity than Nara and Rohri, but this does not yield better gross and net returns. The higher cropping intensity achieved through the conjunctive use of saline and marginally fresh groundwater compromised the per acre yield of the major cash crop, i.e., cotton, and compromised the land quality due to the continuous use of groundwater for cropping. Other than yield compromise, groundwater use has an economic cost associated with its extraction, which further reduces the net return. Canal water scarcity also confirmed this pattern by examining the Delivery Performance Ratio (DPR) data.

Figure 7. Summary Results Showing how Distributional Inequity leads to Economic Inequity

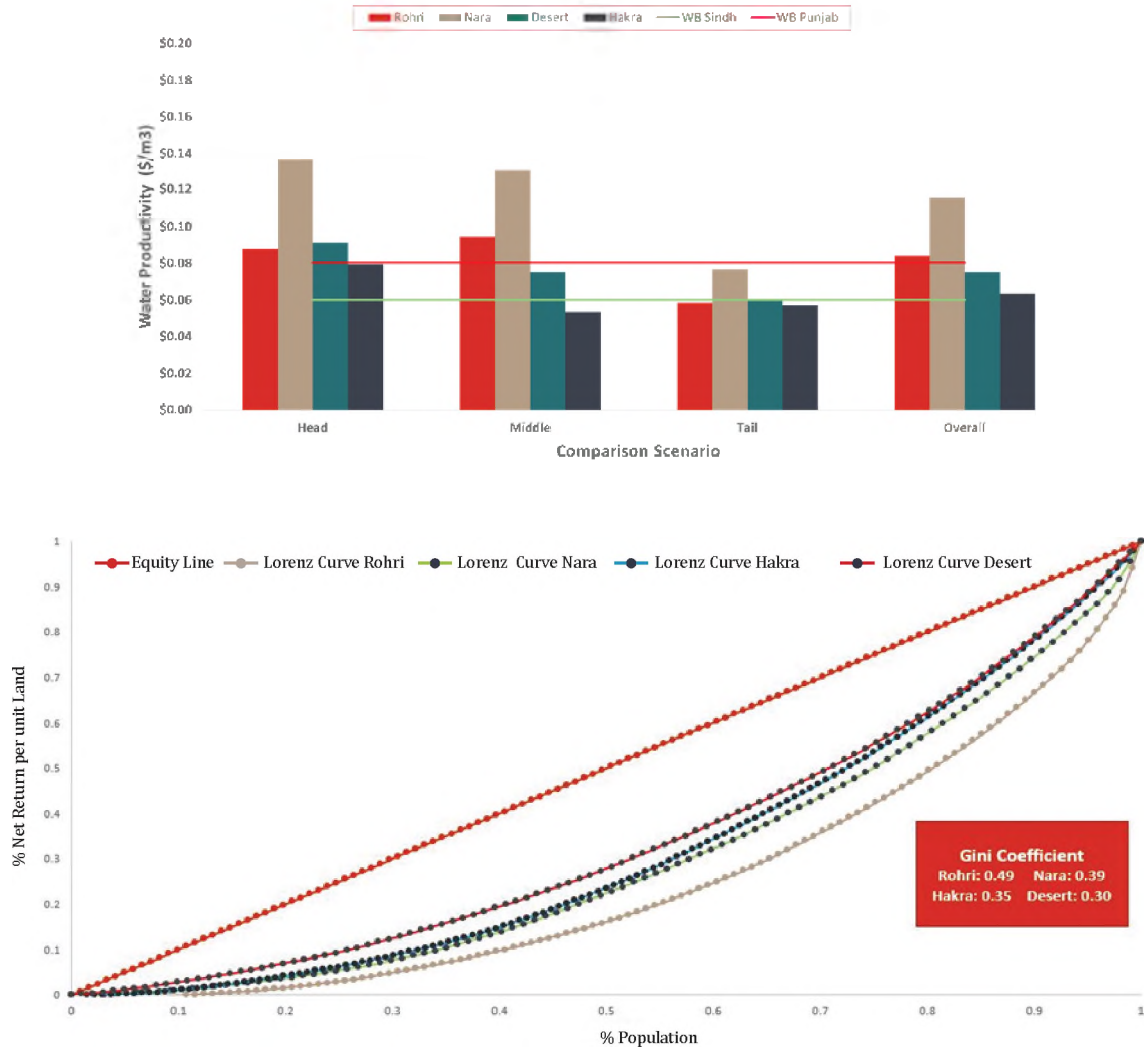


If Nara and Rohri have better DPR than the Hakra canal and even in the Desert canal, then why is the gross and net return of Rohri and Nara not exceptionally higher as one would expect? This apparent anomaly can be partially explained by the fact that Nara and Rohri have low cropping intensity due to waterlogging and higher salinity. A low net return of Rohri and Nara canals provides another clue to the grim reality that respondents in both Rohri and Nara canal areas reported in the survey. According to them, due to the poor state of irrigation infrastructure at the tertiary level canal system, the watercourse is unable to deliver the canal water under gravity flow conditions. Hence, even head reach farmers also need to lift canal water for irrigation, which has an economic cost, thus reducing the net return. Another sharp contrast between the Sindh and Punjab canal systems is that the head and tail distributary land productivity in Punjab is significantly less than in Sindh. The partial explanation for this lower inequity is explained through the percentage difference of higher cash crops at the head reaches, and low cropping intensity at the tail reaches.

Economic Water Productivity (Rs/m^3) [EWP] is an indicator of water use efficiency (WUE), widely used for efficiency comparison and also to assess the economic value of water at any desired scale. The World Bank recently estimated the EWP at the provincial level and reported Punjab having an EWP of 0.08 \$/m^3 for Punjab

and 0.06 $/m^3 for Sindh (William J. Young, Arif Anwar, Tousif Bhatti, Edoardo Borgomeo, Stephen Davies, William R. Garthwaite III, E. Michael Gilmont, Christina Leb, Lucy Lytton, Ian Makin, 2019). Our estimate at the canal level given in Figure 8, shows that overall, Rohri, Nara, Desert, and Hakra canals had 0.08, 0.12, 0.07, and 0.06 EWPs ($/m^3), respectively. We estimated annual crop water use (m^3) from actual evapotranspiration for the crop water year and used it as a denominator for gross per unit land productivity for the EWP estimate. The difference between our estimated results and the World Bank's results is that they used the provincial level gross return estimates and provincial level crop water use. This comparison provides an interesting insight that Punjab, Desert, and Hakra, being at the tail of the provincial canal network, perform near the provincial average but Sindh, Rohri, and Nara perform above the provincial average, which means that Sindh's remaining irrigation network performs much below the provincial average. Through this economic analysis at the canal and the provincial levels, we were forced to conclude that inequity associated with canal regulation is one of the sources of inequity related to agricultural returns, and this inequity, up to a certain extent, is managed through an improved canal schedule.

Figure 8. Comparison of Water Productivity (Rs/m^3) in Selected Canals at Spatial Position

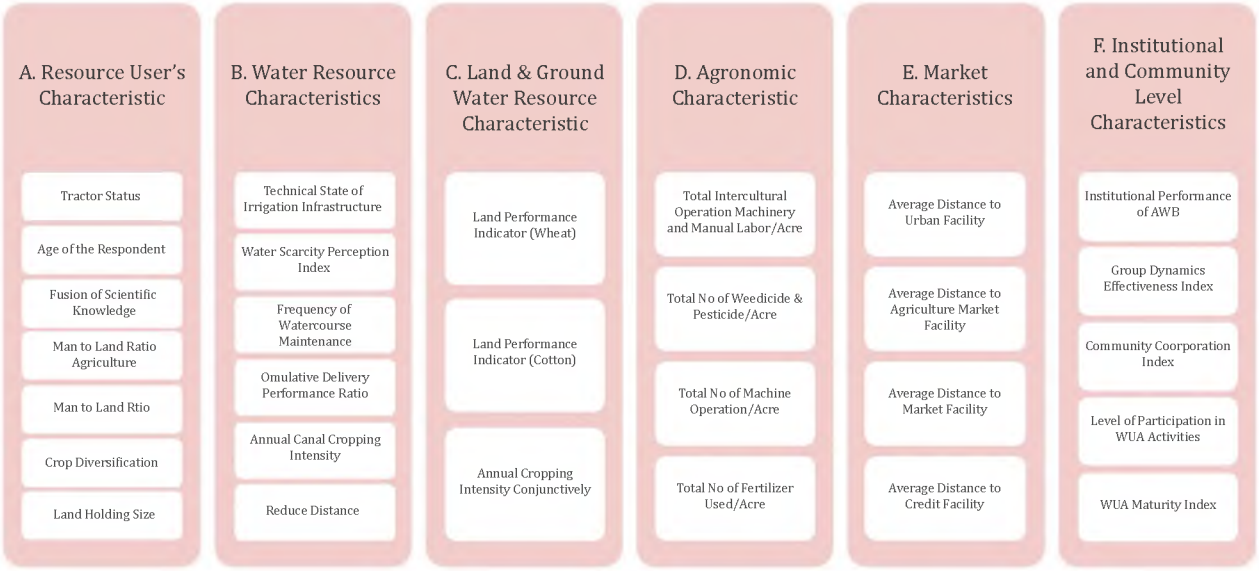


Studying the Resource and Resource users' Characteristics

What explains the economic divergence in agricultural land productivity (Rs/Acre) has remained a research focus of researchers in different regions. Agricultural productivity is influenced through several exploratory predictors, and each of the predictors has a varying degree of influence over agricultural land productivity. We modelled agricultural land productivity (Rs/m^3) as the dependent variable (DV) in a hierarchical regression framework.

Figure 10 enlists the exploratory predictors and their hierarchical progression. The predictors were chosen based on the literature.

Figure 10. Hierarchical Regression Model Framework



Survey Tool Reliability

Cronbach's alpha, which is the most widely used method for analyzing data reliability, was utilized to examine the reliability of the scale employed in this study. It assesses the question's reliability by determining the mean correlation of the internal consistency as well as elements in the questionnaire. The Cronbach alpha coefficient is a number that ranges from 0 to 1. The measuring scale utilized is more trustworthy if it has a higher alpha value. To ensure that the scale being used is credible, the value of scale items must not be less than 0.70, according to a rule of thumb. The table presented below provides Cronbach alpha values for different scales used in the survey tool. All the scales used in the survey tools have a much higher value as compared to the standard one except for GDEI, which is on the margin.

Table 1. Reliability Statistics of the Survey Tool Scale Items

Scale Name	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
WSPI	.909	.911	5
CCI	.821	.815	10
GDEI	.725	.721	10
IP	.864	.888	11
TSII	.820	.855	7

We grouped all these exploratory variables into six categories and labelled them as resource user characteristics, water resource characteristics, land resource characteristics, agronomic characteristics, market characteristics, and institutional and community characteristics. The definitions and construction methodology of these explanatory variables are presented in Annexure-A.

In this section, we have analyzed how our exploratory factors, defined above, relate to land, water, institutions,

community traits, and resource user characteristics potentially contributing to the economic divergence in agricultural return. In the previous chapter, we saw how the changing pattern of canal regulation and water availability produces economic inequity in the existing agriculture-based water economy. Participatory irrigation management reform was introduced to improve this canal regulation inefficacy and irrigation infrastructure management quality by accommodating farmers' voice in the tertiary level irrigation infrastructure management in the shape of farmers' organisations and WUAs, established at each scale of the irrigation infrastructure as shown in Figure 1. An interconnected series of research questions were analysed in this section.

Whether community participation in the WUAs/FOs activities and WUA's maturity significantly contributed in addition to other predictors of agricultural productivity?

To partial out the influence of variables already known as the influencers of agricultural productivity, hierarchical multiple regression was performed to examine the effectiveness of participatory institutions (level of participation in WUA activities/WUA maturity), to predict EWP (Rs/m^3), after controlling for resource users, water resource, land quality resource, markets proximity, and agronomic practices. For that purpose, we grouped the data of both canals, i.e., Nara and Hakra canals, where participatory reform was introduced and WUA's/WCA's still working. Figure 11 provides the model summary of hierarchical regression results at each step of the model.

Figure 11. Summary of Model 1 Statistics

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.420[a]	.177	.150	34.19364	17.67%	6.561	7	214	.000	
2	.726[b]	.527	.495	26.35986	35.00%	21.871	7	207	.000	
3	.852[c]	.726	.703	20.19248	19.96%	49.586	3	204	.000	
4	.859[d]	.738	.710	19.95333	1.17%	2.230	4	200	.067	
5	.866[e]	.749	.718	19.70852	1.15%	2.250	4	196	.065	
6	.868[f]	.754	.716	19.77418	0.48%	.740	5	191	.594	1.626

Preliminary examination of model statistics such as VIF, Tolerance, Durban Watson, Normality P-P plot, and residual plot for multiple regression assumption testing gives satisfactory results. All predictor variables were not statistically correlated with Economic Water Productivity (EWP).

In the first step of hierarchical regression, resource user characteristics were entered. This model was statistically significant and explained 17.67% of the EWP variance. Out of seven factors, age, tractor status, land holding size, and man-to-land ratio made a significant unique contribution to the model (see Table 1 for standardized coefficient and nature of the relationship for each predictor).

After adding the water resource characteristics block predictors in Step 2, the total variance explained by the model as a whole was 52%. The introduction of this block explained an additional 35% of the variance in EWP after controlling for the first block predictor, which was a significant contribution at a 99.9% confidence interval. During the second stage, cumulative DPR, RD, ACCI, and ACWU was a significant predictor.

In the third step, after entering a land quality-related set of predictors, the overall model predictor power reaches 72.6%, and this additional block contribution was 19.96% and statistically significant at a 99.9% confidence interval. In this block, land performance for cotton and wheat and the contribution of a tubewell in the cropping intensity were significant.

In step four, after introducing agronomic practices related to block, only 1.17% additional variance in land productivity was explained, and this contribution was significant at a 90% confidence interval, as shown in Table 1.

In the fifth stage, including the average distance to an urban facility, agriculture markets, and credit facility the model explains an additional 1.15% variance at a 90% confidence interval. Entering the community cooperation, group dynamics, WUA maturity index, the level of participation, and institutional performance of AWB at step six only adds a 0.48% contribution to the model, after controlling for all the previous five blocks of predictors, which is not statistically significant.

In the final stage, model predictive power is 75.4%. Among the significant predictors in this stage are age (-.093, .023), tractor status (.112, .012), landholding size (-.122, .021), man to land ratio (.108, .096), water scarcity perception index (-.101, .044), distance of land from the source of water (-.155, .003), annual canal crop intensity (.099, .050), annual crop use (-.473, 000), land performance for wheat (.205, 000) and cotton (.107, .008), groundwater contribution in cropping intensity (.478, 000), total intercultural operations (-.113, .033) and the total amount of fertilizer used (.204, .028).

In the next stage, we hypothesized that our desired independent variables could not capture the variance due to too many controlling predictors, probably due to the sample size limitation. Therefore, in the next step, we used only those predictors that significantly influenced the EWP variance as control variables and check whether our desired predictors have any significant influence. This alteration in the model does not provide any evidence that these community characteristics block having any influence on the EWP. The model statistics for this alteration are presented in Figure 12.

Figure 12. Summary of Model 2 Statistics

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.321[a]	.103	.087	35.43835	10.326%	6.247	4	217	.000	
2	.699[b]	.488	.469	27.02830	38.473%	40.013	4	213	.000	
3	.847[c]	.718	.703	20.20718	22.985%	57.024	3	210	.000	
4	.850[d]	.723	.705	20.13498	0.468%	1.754	2	208	.176	
5	.854[f]	.730	.704	20.16189	0.698%	1.044	5	202	.393	1.558

EWP is an indicator related to water use efficiency that determines how much one cubic meter of water produces economic value in the system. As traditional estimation techniques to convert irrigation into the volume of water applied have limitations, we used the average actual evapotranspiration for each respondent's head, middle, and tail reaches. This approach also has its limitations as it does not provide the variance within each distributary.

In addition to that, there is no economic rationale to optimize the water use at the farm because water price is minimal. Our regression analysis also confirmed that annual crop water use (ACWU) negatively correlates with EWP because farmers do not have a strong rationale for optimizing it.

Thus, to check our result's robustness, we ran the same regression by changing EWP (Rs/m3) to land productivity (Rs/Acre) as the dependent variable since optimizing land productivity has a direct economic rationale. The results of this regression analysis are provided in Figure 13. In this model again controlling for the already known predictors that influence land productivity, it was again confirmed that WUA's maturity and community characteristics do not significantly influence the outcome. However, the level of participation in WUA's activities has a positive relationship with land productivity at a 90% significance level. A.M. Chaudhary explored this relationship and found that the level of community participation in irrigation management is linked with higher

water use efficiency (A.M. Chaudhry, 2017). She further explained that the farmers belonging to communities that are more involved in channel maintenance (i.e., desilting, cleaning, and repairing), participation in the election process to elect/select their representatives, involvement in the water charges collection (i.e., Abiana), and local level dispute resolution were more efficient in water use as compared to others (Ibid).

Table 2. Statistical Standardized Coefficients in Different Regression Models

+,*, **, *** shows the significance level at 90, 95, 99, and 99.9% respectively. Black bold showed a positive significant contribution and red bold showed a negative. Model 1 includes all variables. Model 2 replaces the non-significant contributor. Model 3 replaces the dependent variable with land productivity						
Variables Name	**Model 1**	**Model 2***	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Age	**-.093(.023)***	**-.112(.006)****	**-.12(.01)***			.027(.537)
Land holding Size	**-.122(.021)***	**-.086(.086)+**	**-.12(.04)***			**-.043(.402)**
Tractor status	**.112(.012)***	**.125(.004)****	**.09(.08)+**			
Crop Diversification index	.049(.314)					.039(.449)
Fusion of Scientific Knowledge	.016(.718)					.010(.841)
Man to Land Ratio Agri.	-.090(.144)					
Man to Land Ratio	**.108(.096)+**	.023(.625)	.02(.78)			
Reduce Distance	**-.155(.003)****	**-.106(.023)***	**-.16(.000)*****			**.102(.050)***
Water Scarcity Perception Index	**-.101(.044)***	**-.107(.017)***	-.07(.16)			**.128(.03)***
Technical State of Irrigation Infrastructure	.054(.244)					**.088(.080)+**
Cumulative Delivery Performance Ratio	-.022(.685)					
Annual Canal Cropping Intensity	**.099(.050)***	**.099(.038)***	.06(.24)			
Annual Crop Water Use	**-.473(000)*****	**-507(.000)*****	**-.31(.000)*****			
Land Performance Index Cotton	**.107(.008)****	**.105(.008)****	**.12(.01)***			
Land Performance Index Wheat	**.205(.000)*****	**.202(.000)*****	**.22(.000)*****			
Annual Cropping Intensity Conjunctively	**.478(000)*****	**.503(.000)*****	**.52(.000)*****			.023(.648)
Total Intercultural Operation (ML)	**-.113(.033)***	**-.103(.045)***	**-.12(.04)***			
Total No Weedicide & Pesticide	-.012(.882)					
Total No Fertilizer	**.204(.028)***	.084(.150)	.05(.46)			
Total Machine Operation	-.139(.171)					
Avg. Distance Urban Facility	.006(.887)					
Avg. Dist. Credit Facility	.081(.226)					
Avg. Dist. Agri. Market	.077(.207)					
Avg. Dist. Market Facility	-.068(.175)				**Urban Proximity**	.076(.100)
Community Cooperation Index	.085(.137)	**.094(.096)+**	-.04(.51)	.095(.295)	.365(.000)***	**.196(.003)****

Group Dynamics Effectiveness Index	-.025(.628)	-.043(.404)	-.01(.81)	-.049(.542)	.300(.000)***	.026(.644)
Institutional Performance AWB	-.074(.265)	-.075(.240)	-.07(.33)	**.227(.022)***		**.262(.000)*****
WUA Maturity Index	.012(.837)	-.001(.982)	.03(.62)	.013(.873)		**.411(.000)*****
Level of Participation in WUA	.042(.466)	.059(.307)	**.11(.09)+**	-.038(.702)	.263(.000)***	
R Square	**.754*****	**.730*****	**.64*****	**.064****	**.572*****	**.614*****
Dependent Variable	**Economic Water Productivity (Rs/m³)**	**Economic Water Productivity (Rs/m³)**	**Land Productivity (Rs/Acre)**	**Composite Irrigation Management Performance**	**Institutional Performance of AWB**	**Level of Participation in WUA**

Figure 13. Summary of Model 3 Statistics

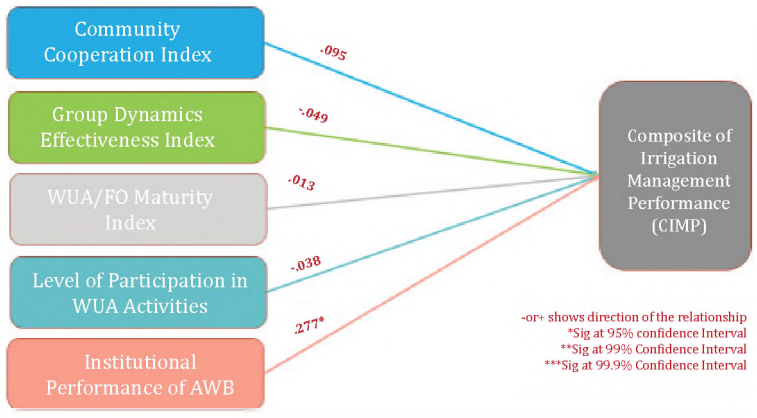
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.280[a]	0.08	0.06	40790.80	7.9%	4.62	4.00	217.00	0.00	
2	.581[b]	0.34	0.31	34914.22	25.9%	20.80	4.00	213.00	0.00	
3	.787[c]	0.62	0.60	26644.84	28.2%	51.91	3.00	210.00	0.00	
4	.791[d]	0.63	0.60	26527.61	0.7%	1.93	2.00	208.00	0.15	
5	.798[e]	0.64	0.60	26465.77	1.1%	1.19	5.00	203.00	0.31	1.60

Do community characteristics have a relationship with Irrigation Management Performance?

In this section, we examine the community characteristics' relationship with irrigation management performance and hypothesize that these might be our desired predictors, influence the irrigation management performance directly, and then irrigation management performance, influence land, and economic productivity as shown in our previous analysis. We construct the Composite Irrigation Management Performance (CIMP) index to test this hypothesis. We define CIMP as a combination of agricultural land productivity, cropping intensity with canal and tubewell water use, technical state of irrigation infrastructure, and cumulative delivery performance ratio. Since all these scale variables have different measurement units, to construct the composite index, we first standardized all individual items and then calculated the composite by assigning equal weight to each variable's z scores. We used the CIMP as a dependent variable and LP, WUAMI, IPAWB, CCI, and GDEI as predictors.

Figure 14. Summary of Model 4 Statistics

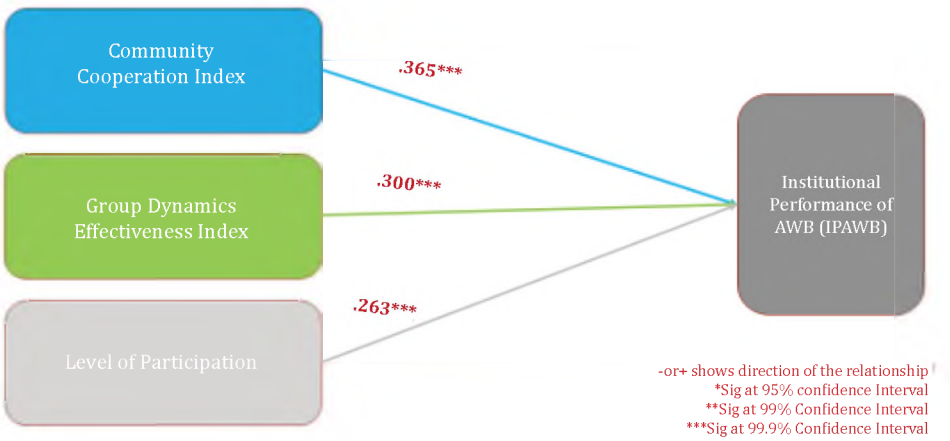


In the regression model, as shown in Figure 14., IPAWB has a significant unique contribution to improving the CIMP index. The standardized beta coefficient weights suggest that with every one unit increase in the institutional performance of the Area Water Board, irrigation management performance increases by 0.27%. Hence, at this step, we conclude that the AWB performed its duty better and managed the exchange of information related to irrigation decision-making, and controlled the rent-seeking behaviour of irrigation officials more effectively, which improved irrigation management performance and provided more equal agricultural economic returns among all farmers. This is an important result for understanding the role of collective action in improving irrigation management performance. This result gives us a strong reason to examine the causal pathways further.

What is the relationship of community characteristics with the institutional performance of the Area Water Board?

The next level of inquiry is how IPAWB could be improved. The community participation in WUA's activities, community cooperation index, IPAWB group dynamics effectiveness, and how they influence it are also explored. We put the IPAWB as dependent variables and used the community cooperation index, group dynamics effectiveness, and level of participation in the WUA activities as predictors in the regression. The model summary statistics are given in Figure 15. We find that all these community characteristics have a positive and significant contribution to improving the institutional performance of AWB. The intention to introduce participatory irrigation reform uses this social capital as a resource for improving irrigation management but the factors that limit its effectiveness is our next level of inquiry in the following sections of the report.

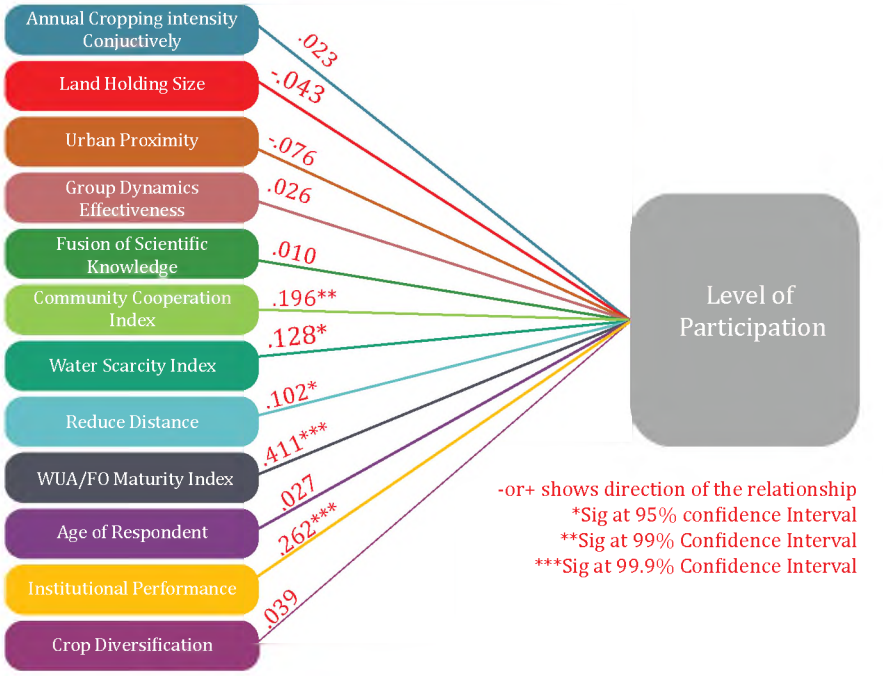
Figure 15. Summary of Model 5 Statistics



What factors explain community participation in participatory institutions?

In this section, we examine the factors that limit or enhance community participation in participatory institutions. This analysis can help devise the future course of action to enrich the participatory irrigation management reform more effectively. For this analysis, we used the level of participation of the community in the participatory institutions as a dependent variable and community cooperation index, group dynamics effectiveness index, landholding size, the use of tubewell (annual cropping intensity conjunctively), urban proximity indicator, reduced distance, water scarcity perception index, crop diversification, and fusion of the scientific knowledge as explanatory variables.

Figure 16. Summary of Model 6 Statistics



Regression results as shown in Figure 16 suggest that the WUA maturity index, the institutional performance of AWB, the water scarcity perception index, the community cooperation index, and reduced distance have a unique positive contribution, whereas landholding size has a negative but statistically insignificant relationship. Overall all the predictors explain a 61% variance in participation at a 99.9% significance level. Based on the emic and etic perspectives, land asymmetry influences the working environment of the participatory institutions. We analyzed specific questions such as "what do you think, are large farmers dominant in the WUAs/FOs decision making" and "being a member, I feel that large farmers are getting more water than me." Responses to the above questions showed that land asymmetry has a problematic relationship with the working environment of participatory institutions and maintaining the distributional equity of canal water as shown in figures 17 and 18. In the next chapter, we discuss specifically what went wrong with the reform process and how it be corrected. It relies on the literature review of particular case studies and qualitative parts of the survey (focus group discussions/key informant interviews/content Analysis of SWMO).

Figure 17. Large farmers getting more water compared to me

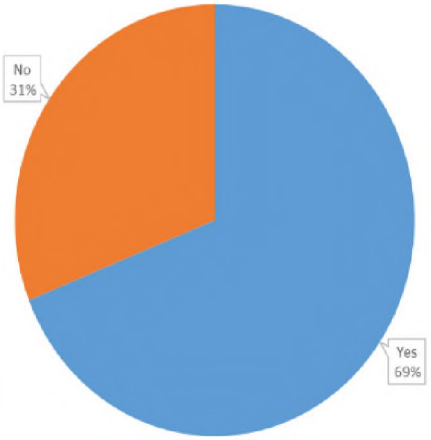
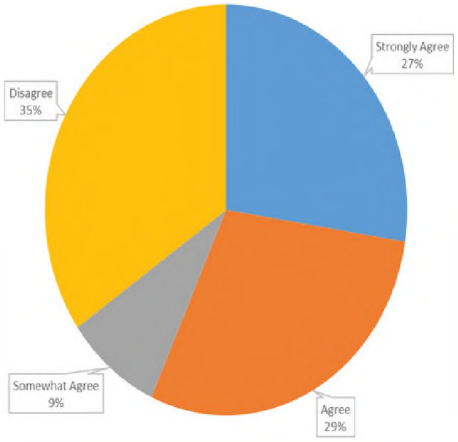


Figure 18. Large farmers dominant in WUA/FO decision making



PIM Agenda Implementation in Theory and Practice

What Explains The Lackluster Performance of PIM

There are three approaches currently in practice to manage the common pool resource: 1) strict state control, 2) user group collective action, and 3) market forces or complete privatisation of the resource. Pakistan has adopted the second model with a limited role of the user group under the existing irrigation agencies (see the PIDA Act 1997 and SWMO 2002). The delegation of power is limited and a more commanding role of the existing irrigation bureaucracy. Recent studies show that the performance of this limited delegation of power is not satisfactory (Ali, 2020). Here the question is what factors explain this unsatisfactory performance after almost two decades have passed? There might be numerous explanations for this poor performance. A few of these explanations are related to the neoliberal notion of restructuring and missing the localized context.

Politics of Reform and Resilient Irrigation Bureaucracy

The irrigation bureaucracy was interested in getting the WB loan for the irrigation system and drainage program. The Bank proposed the reform based on the Bank's experience with participatory ideas in Mexico, the Philippines, and Indonesia, among other countries. The bureaucracy was not interested in any attempt to curtail its role in decision-making and the power it enjoyed in the status quo. The bureaucracy opposed the reform idea, but the Bank used the loan package as an arm-twisting tool to convince it of the reform ideas.

In this context, the Bank was willing to provide a loan of 28.5 million US $ for the National Drainage Programme (NDP) in 1997 (Briscoe & Qamar, 2005), with a promise of the irrigation system reform. The core elements proposed in the reform package with NDP were (William J. Young, Arif Anwar, Tousif Bhatti, Edoardo Borgomeo, Stephen Davies, William R. Garthwaite III, E. Michael Gilmont, Christina Leb, Lucy Lytton, Ian Makin, 2019):

- Reorganize the provincial level irrigation departments into decentralized public utilities at the command level with full independence to collect and spend irrigation service fees and authority to gradually withdraw subsidies and privatize them.
- Provide full authority to the farmer's organisations at the distributary level for the collection and expenditure decisions about the irrigation service fee.
- Establish water markets for water trading and delink water rights from land ownership.

The irrigation bureaucracy amended the initial idea for several reasons, which included:

- Renamed the proposed decentralized public utilities as AWBs but the idea of privatisation was neither implemented nor ruled out.
- Farmer-led management was implemented via FOs and WUAs/WCAs.
- Water markets were not established, and water rights were still tied to land rights.

These amendments were based on several technical reasons. The reasons were the scale and complexity of technology, and poor and supply-driven features of the irrigation system. Other reasons to reframe the reform agenda were the collusion of interest among the irrigation bureaucracy, big landowners, and opinion leaders. For example, the idea of delinking water rights from land rights was considered equivalent to land reform, and privatisation was considered a push for foreign control of Pakistan's irrigation (Edward J. van der Velde, 2004). Pakistan Kissan Board, apparently a medium and small farmer body, opposed this reform based on the apprehension discussed above because this farmer body has a strong ideological inclination towards Jamat Islami, which historically has remained an opponent of previously attempted land reform.

Water sector reforms were also introduced in the irrigation sector, and Provincial Irrigation and Drainage

Authorities (PIDAs) were established in 1997. PIDA's act highlights its overarching goal in its preamble "Whereas it is expedient to establish the Punjab Irrigation and Drainage Authority to implement the strategy of the Government of Punjab for streamlining the Irrigation and Drainage System; to replace the existing administrative setup and procedures with more responsive, efficient and transparent arrangements; to achieve economical and effective operation and maintenance of the irrigation, drainage and flood control system in the Province; to make the irrigation and drainage network sustainable on a long-term basis and introduce participation of beneficiaries in the operation and management."(PIDA Act, 1997)

There was an assumption that building the formal institutional structure would transform prior social relationships. However, the existing power structure proved resilient. The power to control irrigation water is not separable from power in other life domains; the old irrigation bureaucracy perhaps concealed this fact. The attempt to decentralize management exposed informal power structures that could not be easily changed by changing formal structures. Decentralisation-based efficiency outcomes hold the assumption that specific paper regulations which allow collective action by default promote equity, efficiency, and financial self-sufficiency in irrigation management. After two decades of reforms, the experience proved this simplistic assumption wrong.

It was also assumed that institutional working affects institutions to become independent from the external or internal forces that constitute them once institutions are formed. Under this assumption, the irrigation department's oversight role is defined in the reform package. However, unfortunately, in our situation, this assumption does not hold. In contrast, both institutions engaged in institutional infighting, as reported in many key informant interviews. The irrigation bureaucracy used its leverage to oversee the reform process as a tool to twist the arms of new institutions. Thus, the idea of getting out of the influence never materialized. Why does it happen?

The cadre recruited the new institutions to mobilize the farming community limited in its knowledge of the technical aspects of irrigation infrastructure. Thus, the new institutions' dependency on the irrigation bureaucracy provided them leverage in this nested governance equation. It was not authorized by the farmers' organisation or AWB in the reform package that they hire technical staff independent from the irrigation bureaucracy. Old bureaucracy has a central role in this institutional power equation, therefore, the localized ownership of the resource does not exercise its paper power in reality.

Is Scaling-Up Possible with External Push

As pointed out by (Mansuri & Rao, 2004) that effective community-based initiatives require slow, gradual, and continuous learning-by-doing, with a project design that gradually adapts to the local conditions by learning from the false starts and mistakes that are endemic to all complex interventions. They illustrate that the community-based intervention requires the following conditions for successful scaling-up:

- The scaling-up strategy starts with gradual "piloted scaling-up" to "phased scaling-up", and then "untested scaling-up" on a national scale.
- Scaling up requires a strong work ethic, rigorous evaluations, and reliable monitoring systems to provide constant feedback.
- Careful attention to the training of the core cadre of the social mobilisation unit.
- The country's strong political commitment to a cultural change in the institutional environment is to be more responsive, transparent, participatory, and downward accountable.

Mansuri and Rao (2004) studied community-based and community-driven development projects and summarized the evidence about the question that "is rapid replication of successful community initiatives possible through external interventions as the World Bank and other donors are attempting to do?" They came up with an explanation that the successful replication of highly motivated groups, charismatic individuals, and the long-term vision of structural transformation through dedication, patience, and creativity is difficult to scale up.

Because when this daunting task is handed over to salaried professionals, whose only motivation is the wage, promotions and incentives lose the idea's actual cultural, social, and historic essence. Scaling up such ideas through external interventions mostly depends upon the social mobilizer or community trainer's capacity to seed the innovative idea in the community and mobilize it.

As pointed out by SIDA officials in response to a question "What do you see as the role of SIDA in the past and current?" a key informant in an interview said:

> "I don't see any big difference between past and current SIDA. I came here after the 2002 ordinance. Everybody here wants power but without knowledge. At this time, the AWB does not have FOs, they want FOs as they want powers".

The discourse analysis of this quote unpacks the internal and external environment of the reform process. This quote also depicts no iterative learning process from the interventions, which merely focused on the incentive and power capturing. In a key informant interview, when asked what types of challenges the SIDA social mobilisation unit faced for effective social mobilisation, a social mobilisation team member responded with the following:

> "According to my view, social mobilizers or social workers are neglected as compared to engineers. Engineers get everything, i.e., proper offices, proper staff, AC cars but no one wants to cooperate with us. We are not properly facilitated".

This quote validates the problem (as mentioned earlier) of salaried professionals regarding perks, drive, and a competitive institutional environment, which is supposed to mobilize the community for effective participation and protect resource users' rights in a contested environment.

Bruns & Atmanto, (1992) and Suhardiman, (2008) studied the Indonesian context of irrigation policy reform and reported that the irrigation bureaucracy transformed the Irrigation Management Transfer (IMT) program into a construction program. They also noted that 'the capacity of bureaucrats to anticipate reform and take action, defend their interests, perspectives, and privileges and shape reform in a way that supports their institutional survival. Suhardiman et al., (2014) studied four case studies of irrigation management transfer in Indonesia, Mexico, Uzbekistan, and the Philippines. They argued that irrigation (policy) reform could not be treated in isolation from the overall functioning of government bureaucracies and the broader political structure of the states. Understanding how and why the irrigation bureaucracy shapes reform processes and outcomes indicate reforms' actual significance. This aspect is related to the fourth condition under which overall government support for the reform process is a precondition for scaling up the interventions. Bureaucratic reforms do not work in silos; they require overall civil service reforms in every field of the political spectrum. It is widely perceived among the SIDA and PIDA officials that the irrigation bureaucracy does not want to see the irrigation reform succeed and replace their institutional powers.

Key informants from SIDA officials pointed out the bureaucracy's role to impede the reform process and termed the bureaucracy an "outdated hierarchy."

> "Overall, if we look, the problem is in the outdated hierarchy, which is set in our institutions. We are from the development sector; our mindset has now changed. But now it's time to change the trends and mindsets of others".

> "The involvement of different agencies hinders the overall success of an FO."

> "The irrigation department staff doesn't like FOs. No one likes to distribute their powers".

What is a Social Mobilisation or Farmers' Engagement Process

Historically, the Irrigation and Power Department (IPD) have enjoyed extraordinary power in preparing water schedules, approving new water allocations, and revising existing allocations under the Irrigation and Drainage

Act. The IPD uses its power for the benefit of the powerful landed elite (Kin Power and Landlord Class). On the other hand, the voices of the small and tail-end farmers are not much appreciated. Sindh Water Management Ordinance (SWMO) tried to decentralize the powers by including the farmers in the decision-making. Thus, SIDA established the "Social Mobilisation" units to mobilize the farmers for active participation in the reform process and engage with previous power structures. However, farmers' engagement or participation was not achieved up to the initially perceived level. What went wrong? Looking into the three types of training, i.e., basic training, specialized training, and refresher course, we found that the training component is more skewed towards technical parts, such as explaining SWMO institutional features, organisation management (housekeeping) of records, and financial management and procedures for Abiana assessment and collection. In specialized training, technical management of irrigation water like flow measurement is covered but neither general nor specialized training cover the aspects such as how the power from previous institutions shifts to the new farmers-managed institution, how small farmers engage with formal and informal power structures and established their rights, how and what sort of organisational measures improve the hydro solidarity, trust, and collective action, and counter the kin-based and land-based power asymmetry. Unfortunately, training topics do not cover the political dimensions of irrigation management.

Pettit (2016) studied the Swedish Development Agency's intervention for citizen engagement and critiqued the neoliberal understanding of 'citizen engagement' based on the rational choice to challenge the power present in different forms (Mehta, 2016). He argued how a neoliberal understanding of power ignores the 'civic habitus' and cannot create a more enactive and imaginative form of citizen agency, capable of challenging or transforming invisible power boundaries in society.

Extending the above argument, if we reflect upon the training material and training approach, in our case study of the participatory irrigation reform, we found that engaging the farmers was insufficient to undo the power habitus of small farmers. The ways it delivered during the farmers' engagement at a farmers' organisation formation stage could not deconstruct power boundaries historically associated with the irrigation bureaucracy and the powerful kin and big landholding caste. The irrigation bureaucracy and local kin and land-based powerful elite had an invisible power from which only patrons and clients benefited. The fundamental assumptions in participatory irrigation are that the irrigation bureaucracy and farmers are two distinct categories whose interests are opposite. However, in reality, this is not the case. The irrigation bureaucracy exercises power with the support of big farmers.

Here one can argue that small farmers are more in number. Also, reform packages (SWMO 2001) ensure participation at a different tier of the nested governance structures (as shown in Figure 1 and Annexure C) and are in a better position to engage this nexus of the powerful elite and the irrigation bureaucracy and more ideally can challenge too. It is pretty easy in theory but in reality, how the power dynamics work in society is to understand whether SWMO alone provides enough power to small farmers to engage meaningfully or challenge this nexus. In the presence of a highly kin-based and land-based asymmetric society, only the SWMO provisions were not sufficient to empower the powerless and challenge this power asymmetry.

Contrary to the development agency objectivist approach, (Pettit, 2016) suggested a transformative approach to citizen engagement, which includes "action learning processes that focus not only on critical reason and awareness but would complement this with more reflexivity, creativity and embody methods of learning and practice. These methods would draw on the imagination and envisioning of cultural change, and would use multidimensional methods of narrative, storytelling, visual and artistic expression, music, movement, and theatre."

In our case study, we conclude that irrigation bureaucracy and powerful elite nexus cannot be challenged without small farmers' movement and meaningful moderation of the land asymmetry. This task is not a part of the reform package. If we further extend this argument and talk about introducing a participatory reform and engaging farmers for that purpose, whether the implementing agency (SIDA) and development aid donors are interested in empowering the powerless and small farming community or only it (Implementing Agency) engages with the reform for international credibility as an isomorphic mimicry and taping the development budget.

Below, we present some empirical evidence that shows that the reform process and training components cannot trigger the environment for collective action and cooperation for maintenance. The evidence shows that hydro-solidarity between the farmers at the head and tail reaches, and improves trust among the water users. The response does not somehow show satisfactory participation or engagement with the reform process. Overall, reform cannot generate the momentum of cooperation, hydro-solidarity, and interpersonal trust level within the organisational structure. If we look into the response to the question "Most people who live on this [watercourse/distributary] can be trusted", we see that trust among the community at the WCA level was slightly better than at the FO level (see Figure 19). However, unfortunately, this community-level trust is not transcended into the WCA and FO institutions.

Figure 19a. Most people who live on this watercourse can be trusted

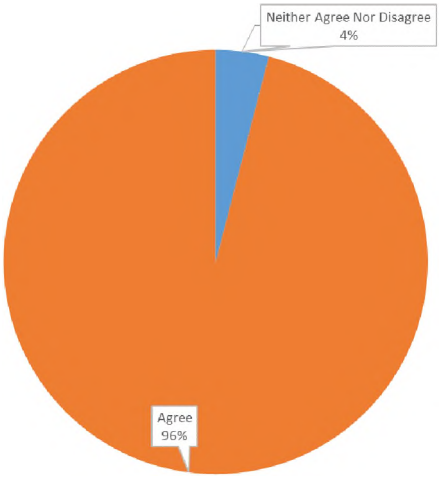


Figure 19b. Most people who live in this distributary can be trusted

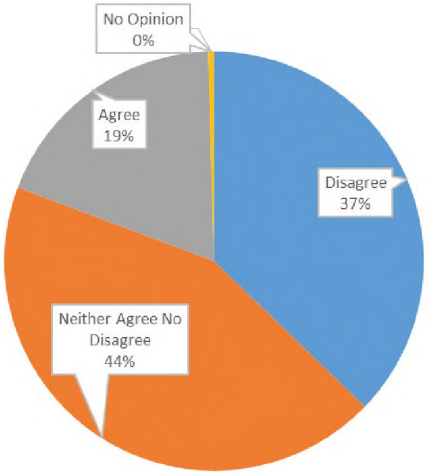


Figure 20. I have a feeling WCA office bearers getting more water as compared to me

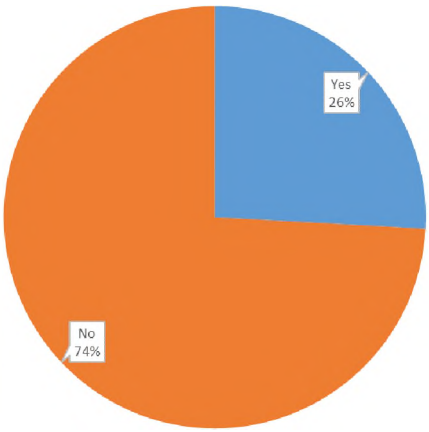


Figure 21. I have feeling FO office bearers getting more water as compared to me

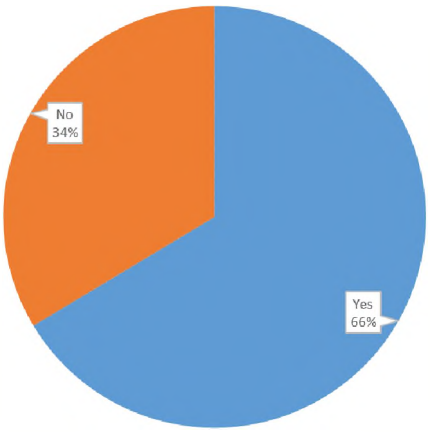


Figure 22. I have a feeling that Large Farmers are getting more water as compared to me

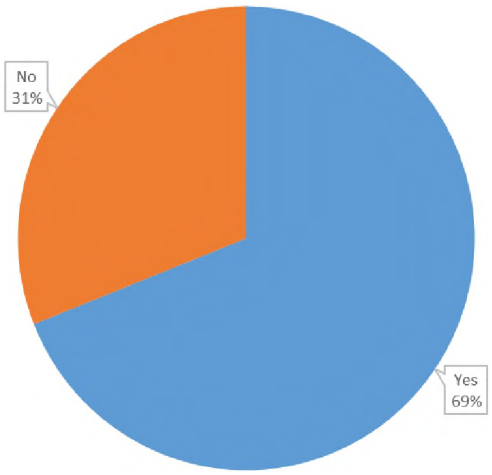
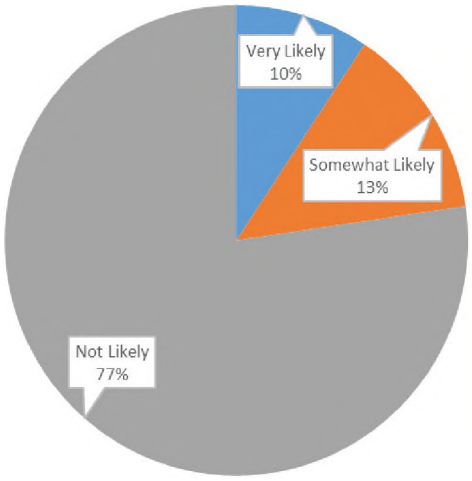


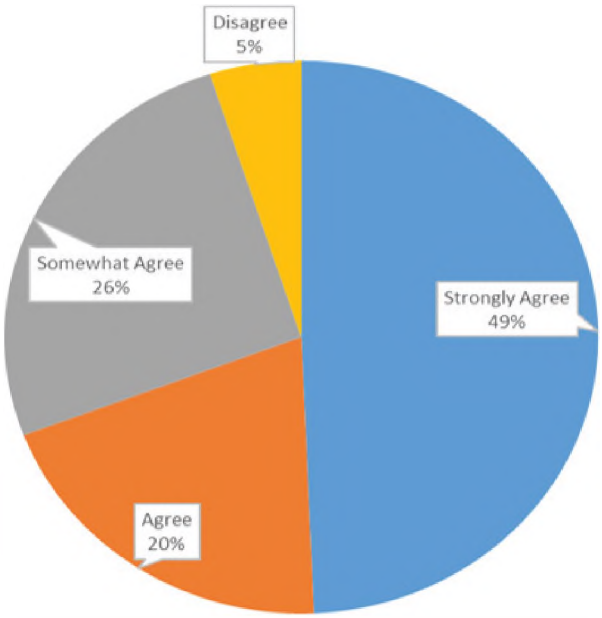
Figure 23. When some watercourses are not getting enough water, do the farmers of other watercourses show concern and empathy?



Scanty Understanding of the Reform Bylaws

The SIDA Act or the Sindh Water Management Ordinance (SWMO) at the farmer level and how SIDA capacity-building units operate cannot play their supposed role. The FO/WCA members' knowledge regarding the bylaws of the new participatory transition creates a sense of ownership. The members were generally aware of the reform process but a detailed study and understanding of the bylaws are needed.

Figure 24. Are you aware of the structure and functioning of Irrigation reforms laws



The possible reasons for this scant knowledge are a low investment in rigorous training from the SIDA side, less enthusiasm from the farming community to involve in the reform process, and low literacy rates because it limits detailed reading of the document and more reliance on oral communication. The essence of the PIM is that it empowers farmer organisations to take ownership of the management affairs of the irrigation system. Surprisingly, in the fieldwork with different project assignments, it was observed that only a few WCA and FO committee members had studied the bylaws in depth. In some cases, the FO chairman had a very superficial knowledge of the reform process. The total knowledge stock is limited to the extent that the FO chairman has the authority to collect the fee, of which 60% is submitted to SIDA and 40% is used for FOs' O&M expanses.

One FO chairman even pointed out that we only collect the Abiana to cover the SIDA share. In one FO, we found that the FO chairman collects the SIDA share from some influential landowner and compensates that influential landowner by more inequitable water distribution. The tail farmers of this distributary reported inequity in water distribution too. This elite capture and the misuse of power are also pointed out in a World Bank policy paper (Hanan G. Jacoby, Ghazala Mansuri, 2018). The paper studied the discharge measurement taken in Punjab and reported that water theft increases in distributary managed by farmers' organisations compared to the bureaucratically controlled irrigation system. This study also reveals that water theft is more along the channels where land inequity is higher. It is important to note that big landowners are situated at the channel's head.

4. CONCLUSIONS

We intended to answer five key research questions through this research study. The first two research questions were analysed based on multiple indicators from an equity perspective. The first question was how the reform impacts distributional equity as compared to the non-reform area. The second was if the reform can enhance agricultural productivity compared to the non-reform area. From a head-to-tail equity perspective, the reform area in Sindh performs better than the non-reform site, whereas, in Punjab, both canals have performed within the permissible limits (as shown in Figure 7). Although the reform area in Sindh is better than the non-reform area, the performance is not up to the mark. Still, the reform area has a considerable inequity between head and tail reaches as measured by Gini Index (0.39), shown in Figure 9. During the survey and key informant interviews, it was observed that the tail farmers of the Rohri canal are more deprived of their basic right to water as compared to the Nara canal. Despite having almost the same ethnic, social, and physical characteristics, the tail of the Nara canal has more cropping intensity than the tail of the Rohri canal. This difference can also be seen in the tail channel performance in Nara and Rohri for all the indices. The difference between Nara and Rohri canal performance was associated with the legal status of farmers' participation due to external pressures such as aid requirements for token participation of tail users for the legitimacy of the new governance regime. Nara tail distributary had a legal channel or platform to raise their voices against unjust canal regulatory practices of irrigation bureaucracies.

The empirical evidence regarding the second question suggests that overall on the main canal level the land productivity (Rs/Acre) of the non-reform area was better as compared to the reform area but economic water productivity ($/m3) of the reform area was better as compared to the non-reform area in Sindh. On the other hand, in Punjab, non-reform performed better on both indices as compared to the reform area as shown in Figure 8. Better land productivity of non-reform sites in Sindh was simply due to the presence of high delta cash crops and orchards (banana and mango) in the middle and head sections of the Rohri canal. In terms of EWP, this situation reversed because Nara produced more economic value per unit of water.

Thirdly, we explored if this divergence in agricultural productivity was associated with community and institutional characteristics. We did not find a strong statistical relationship between the community and institutional characteristics, i.e., WUA's maturity, Community Cooperation index, Group Dynamics Effectiveness Index, and the institutional performance of the AWB, with agricultural productivity. However, farmers' participation in WUAs activities had a positive relationship with land productivity at a 90% significance level. A.M. Chaudhary explored this relationship and found that the level of community participation in irrigation management was linked with higher water use efficiency (A.M. Chaudhry, 2017). She further explained that the farmers belonging to communities who were more involved in channel maintenance (i.e., desilting, cleaning, and repairing), participated in the election process to elect/select their representatives, involved in the water charges collection (i.e., Abiana), and

local level dispute resolution were more efficient in water use as compared to others (Ibid).

Fourthly, we explored what resource and resource user characteristics explained farmers' level of participation in WUAs activities. Our causal inference (as shown in figures 14,15, and 16) suggested that predictors relying on canal regulation significantly determined the agricultural productivity and institutional performance of the AWB positively associated with irrigation management performance-related predictors and the performance of AWB is linked to community characteristics and farmers' level of participation in WUAs activities. Hence, the level of participation has multiple caveats linked to resource and resource-user characteristics. There is a long list of factors that under different conditions play positively or negatively to enhance or suppress the level of farmers' participation in participatory institutions. We hypothesized that farmers having access to groundwater were less likely to participate in the WUAs activities and higher landholding sizes had a negative relationship. Similarly, water scarcity index, distance from the source of water, and distance from an urban centre had a negative relationship, whereas, better group dynamics and community cooperation, more scientific knowledge application in agricultural cultivation, WUA/FO maturity index, age of the respondent, the institutional performance of AWB, and crop diversification had a positive relationship with farmers' level of participation in WUAs activities. We found that the WUA maturity index, the institutional performance of AWB, the water scarcity perception index, the community cooperation index, and reduced distance had a unique positive contribution, whereas landholding size had a negative relationship but was not statistically significant. However, access to groundwater facilities, distance from the source of water, distance from an urban centre, and water scarcity index had a positive relationship opposite to what we hypothesized based on the literature evidence.

Scholars generally agree that until resource users consider the resource to be fairly scarce, coordinated action among resource users is improbable. For the case of irrigation systems, Agrawal (2002) and Bardhan (1993) proposed a curvilinear relationship between resource scarcity and collective behaviour, implying that collaboration is more difficult when water is plentiful. Farmers are more likely to manage and maintain systems, according to Uphoff, Wickramasinghe, and Wijayaratna (1990), when water is neither severely limited nor highly abundant, but moderately scarce. the literature reports that the distance from the urban centre (i.e. market access and integration) has both a positive and a negative relationship with collective action. Increased market pressure causes players to become more anonymous, reducing mutual dependence, loosening conventional social relationships, and reducing inter-linkages for possible retaliation in the event of bad behaviour (Ostrom and Gardner, 1993). Another viewpoint hypothesizes that market penetration might boost irrigated agricultural results and, hence, motivates farmers to join cooperative ventures. Qualitatively, we observed that resource size (i.e., the length of the channel), resource user size (i.e., the number of farmers), and ethnic diversity of resource users also had a negative relationship with farmers' level of participation in WUAs activities. Additionally, it was also observed that farmers' level of participation in WUAs activities was far better in those cases, although such cases were exceptional, where politicized social capital was present and farmers remained associated formally or informally with the land rights movement historically.

Presently, there is a movement to end the PIM experiment in Pakistan and reinstate the old irrigation bureaucracy. This is based on the assertions that PIM has failed to deliver on its promises. However, substantial evidence shows that the PIM model was never adequately tested and implemented. Specifically, PIM was introduced through an externally initiated process that treated PIM as a technocratic matter of decentralizing management authority to lower-level administrative units (i.e., farmer organisations and water user associations) rather than a political process requiring a shift of power from elites to non-elites. Shifting formal authority from one group to another is necessary. Without this, the PIM model will struggle to succeed. Below is a list of five overarching key issues currently the PIM is facing in Pakistan, and policy recommendations devised from stakeholder consultations.

5. POLICY RECOMMENDATIONS

Key issues were identified based on an extensive review of global case studies, local-level policy implementation, data evidence, and key informant interviews with stakeholders. Below, we propose a set of recommendations for each policy issue that needs to be considered for improving the PIM.

Issue 1. Weak enforcement of the law, including the Sindh Water Management Ordinance (2002).

The Participatory Irrigation Management (PIM) reform has not been fully implemented, and its full implementation requires some adjustments and innovation at the local level, which include:

1-A. The Sindh Water Management Ordinance (SWMO 2002) has not been fully implemented. We recommend the establishment of a regulatory authority for dispute resolution and an oversight role in the working environment of SIDA.

1-B. The Irrigation department personnel, who come under the jurisdiction of FOs or clusters of the Fos, need to be accountable to the FO's chairman.

1-C. There is a need to introduce changes in the water rights regimes. The clustering of FOs/WCAs can establish local water markets and share the water rights accordingly to improve the canal schedule.

Issue 2. Institutional integration, pooling of resources, and revitalisation of irrigation departments.

2-A. Agriculture extension department has a union council level presence, its staff is underutilized, and its scope of work is saturated. It needs to be revitalized as a "water and agriculture extension service" provider with an updated curriculum. It needs to be coupled with participatory institutions for a better outcome.

2-B. The existing functions of key departments, including PIDs, should be restructured and reformed via transition from an engineering-only solution to a water resources, engineering, and management approach through the induction of experts from diverse backgrounds and the development of cross-sectional/inter-organisational coordination. The monolithic structure of the human resources of these institutions limits their working efficacy. Therefore, these departments must be professionally diverse.

Issue 3. The maintenance of information management and sharing systems is an important pillar of the PIM that appears to have been neglected.

3-A. There is a need to introduce behavioural nudges in SWMO 2005 for better performance of FOs in irrigation service collection. Different slabs need to present on a pilot scale.

3-B. The digitisation of the canal network needs to augment with the real-time maintenance of canal flow data for transparent monitoring purposes.

3-C. Localized decision-making might be difficult in a contested environment; irrigation officials must build capacity to encourage FOs' inputs and collaboration with FOs.

Issue 4. Problems with direct outlets, lift machines, changing cropping patterns, and distributional inequity.

4-A. The practice of direct outlets and lift machines is not allowed in any case, and existing facilitation needs to be incorporated within the irrigation network. These political bribes ultimately cost the poor and marginalized.

4-B. It was observed that changing the cropping pattern towards high delta crops causes distributional inequity between the main canal's head and tail reaches as well as at the distributary scale. This issue of distributional

inequity can be easily addressed by establishing agroecological crop zones in each region with stakeholder consultation and FO compliance.

Issue 5. Land asymmetry affects irrigation management performance and the institutional working environment of participatory institutions.

5-A. The elite capture phenomenon has historical and structural (or institutional) roots, but it is mostly manifested in the small peasantry's passivity. To effectively deal with this issue, a more politicized participatory model for community mobilisation and involvement is required, which will challenge the social and institutional hierarchy.

5-B. WUAs/WCAs need to provide more institutional support such as community-owned agriculture implements cooperatives, small storage houses for harvested commodity handling, collective marketing of agricultural produce in the market, and small loan schemes through WUAs/WCAs, and other community services to improve collective action and trust among different groups. These trust-building measures enhance community integration which ultimately enhances irrigation governance at a local level.

5-C. On a more radical note, targeted land reform (for optimal farm size) needs to be introduced to overcome the negative consequences of exceptionally large and small farms for productivity.

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ANNEXURE-A

Definition and Construction of Explanatory Variables

Resource user's characteristics

Resource user's characteristics block include binary variables;

- Tractor Status (TS) for 1 for having own tractor and 0 for hired tractor use
- Age of the respondents who cultivated the land in years
- Fusion of Scientific Knowledge (FSK) This composite score was measured through survey tool section 24 (see appendix for details)
- Man to Land Ratio Agriculture (MLRA) This ratio was measured as the number of household persons involved in agricultural activities
- Land Holding Size (LHS) This was a measure of the number of land units (acres) under cultivation
- Man to Land Ratio (MLR) This ratio was measured in another way than how many persons are dependent (family size) on the land resource.
- Crop Diversification Index (CDI) this index was measured as the ratio of the number of crops cultivated, reported in the main survey divided by the total number of crops, i.e., 12 that can be grown.

This block of variables can be further divided into two physical resources, LHS, MLR, and variables related to the resource user's decision-making and influenced under different social and behavioral caveats. The descriptive statistics of different variables in this block were presented in Table 3.1

Table 3.1. Descriptive statistics of Resource Users Characteristics

	Name of AWB/ Canal Division											
	Nara Canal			Rohri Canal			Hakra Canal			Desert Canal		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Age (Years)	45	17		48	13		51	15		45	14	
LHS (Acres)	57	73		30	44		15	19		16	15	
CDI (0-1)	0.35	0.14		0.33	0.14		0.25	0.10		0.27	0.12	
FSK (1-10)	4.68	1.85		3.98	1.42		4.54	1.13		4.58	1.06	
MLR (%)	0.83	1.14		1.05	1.42		1.07	1.14		1.13	1.33	
MLRA (%)	0.13	0.18		0.17	0.25		0.20	0.21		0.25	0.28	
TS Yes			45			29			68			24
No			44			76			67			70

Water Resource Characteristics

Water resource characteristics block to combine the canal infrastructure and regulation-related variables, which include:

- Technical State of Irrigation Infrastructure (TSII) (see sections 10.1 to 10.7 of the survey tool)
- Water Scarcity Perception Index (WSPI) measured the adequacy and reliability of the watering schedule and overall perception of the canal water scarcity for irrigation purposes (please see the survey questions 19.1 to 19.5)
- Frequency of Watercourse Maintenance (FWCM) measured as a number in a year
- Cumulative Delivery Performance Ratio (CDPR) was measured from Section 12 of the survey tool. DPR was the estimated ratio of actual canal water supplies to the scheduled supplies. It should have been ideally estimated from the canal from delivery data, but unfortunately, in our irrigation system, the management of canal data is not managed so precisely that it can be used with certain reliability. Different researchers have reported how irrigation officials fudged these datasets easily because this was manually maintained

in the register. Thus, we decided to use farmers' reported information on canal water turns required and received for different crops to estimate the annual CDPR.

- Annual Canal Cropping Intensity (ACCI) as the groundwater use is substantial in our canal command areas and varies in different canal reaches. Thus, to control the influence of groundwater, we estimate the Annual Canal Cropping Intensity (ACCI) based on the information provided by the respondents.
- Reduce Distance (RD) was used as a proxy for the spatial positioning of the respondent land resource along the canal system. It was measured as a distance from the source of water to land with the help of Google Earth.

Table 3.2 Descriptive Statistics of Water Resource Characteristics

	Name of AWB/ Canal Division							
	Nara Canal		Rohri Canal		Hakra Canal		Desert Canal	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
TSII (1-4)	2.12	1.08	1.77	0.96	1.73	0.71	2.21	0.56
WSPI(1.5-4.5)	3.11	1.11	3.07	1.37	3.83	0.66	2.97	0.69
ACCI (%)	110%	54%	105%	61%	80%	50%	163%	45%
ACWU (mm)	1547.43	45.09	2016.78	485.39	2345.78	38.06	2762.33	132.79
CDPR (0-1)	0.68	0.20	0.68	0.25	0.50	0.17	0.68	0.18
RD (Km)	141.57	61.75	77.06	52.33	150.48	26.02	141.76	19.94

Land and Ground Water Resource Characteristics

The land resource characteristics block was used to define the quality of the land. We measured land resource characteristics from indicators: Land Performance Indicator (LPIW) for wheat and LPIC for cotton crops. LPI is the ratio of the harvested yield of wheat and cotton to the potential yield that can be achieved for wheat and cotton. This ratio shows the current potential of the land. We used cotton and wheat because the selected canal command area is designated as the wheat and cotton zone of the country, and cotton and wheat still are the dominant crops in these canals. The gap in the yield is influenced mainly by two factors. The first is related to land quality (salinity and waterlogging), and the second is groundwater availability for conjunctive use. We used cropping intensity as the conjunctive use of the canal and groundwater to capture the effectiveness of groundwater.

Table 3.3 Descriptive Statistics of Land and Ground Water Resource Characteristics

	Name of AWB/ Canal Division							
	Nara Canal		Rohri Canal		Hakra Canal		Desert Canal	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
LPI Wheat (0-1)	0.70	0.23	0.66	0.22	0.77	0.13	0.76	0.14
LPI Cotton (0-1)	0.65	0.67	0.43	0.31	0.56	0.22	0.59	0.21
ACIC (%)	101%	43%	101%	56%	128%	53%	170%	43%

Agronomic Characteristics

Agronomic practices were another block of exploratory predictor that was related to resource user characteristics. This was measured as:

- Total Intercultural Operation (TICOML) performed by machinery or manual labour per unit of land (acre).
- Total Number of Weedicide and Pesticide (TNWP) used per unit of land (acre).
- Total Number of Machine operations (TNMO) per unit of land (acre) performed for the land preparation as primary or secondary tillage.
- Total Number of Fertilizers (TNF) per unit of land (acre) applied as soil nutrient management.

This block of variables covered the majority of the aspects of production technology except for the seed rate, sowing, and harvesting dates of the crops. Since we used agricultural productivity in terms of economic value produced per acre, seed rate and sowing and harvesting dates of different crops varied and were difficult to combine into one variable. For this reason, we did not include those in our model.

Table 3.4 Descriptive Statistics of Agronomic Resource Characteristics

	Name of AWB/ Canal Division							
	Nara Canal		Rohri Canal		Hakra Canal		Desert Canal	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
TNMO (No/Acre)	1.05	1.18	1.76	3.48	1.19	1.15	1.12	1.10
TICOML (No/Acre)	.46	.56	.72	1.06	.35	.41	.22	.22
TNWP (No/Acre)	.58	.72	.80	1.18	.82	.87	.73	.69
TNF (No/Acre)	1.30	1.59	1.90	1.73	1.03	1.08	.89	.82

Market Characteristics

A wide range of literature evidence reports how the market distance to resource users influences farm-level productivity. Keeping in view the importance of the market dynamics influence as a techno-behavioural determinant of farm productivity, we estimated the variables from survey questions. In this block, we included the Average Distance to Urban Facility (ADUF) (which included, the distance of the village to health facilities, a metaled road, distance to an agricultural workshop, and distance to the petrol pump and CNG stations), Average Distance Agricultural Market Facility (ADAMF) (which included distance to facilities that sell seeds, fertilizers, pesticides, agriculture implement workshop, and local shopping market for households), Average Distance Market Facility (ADMF) (which included distance to livestock, grain, vegetable market, and Government procurement centre), Average Distance Credit Facility (ADCF) (which included the distance of village to different types of credit facility (see section 20.3.1 to 20.3.8)). A composite of equal weights of all these variables was named as Urban Proximity Index (UPI). Basic descriptive statistics can be found in Table 3.5

Table 3.5 Descriptive Statistics of Market Resource Characteristics

	Name of AWB/ Canal Division							
	Nara Canal		Rohri Canal		Hakra Canal		Desert Canal	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ADUF (Km)	8.40	5.38	8.41	4.89	8.91	5.08	9.56	8.20
ADCF (Km)	10.22	6.58	13.87	7.92	12.70	8.20	14.56	9.11
ADAMF (Km)	7.50	5.96	8.64	4.96	9.91	5.79	7.28	6.18
ADMF (Km)	8.57	5.81	10.18	5.45	12.70	6.07	16.69	9.32
UPI (Km)	8.55	5.12	10.03	4.64	10.20	5.76	10.84	6.48

Institutional and Community Characteristics

For the institutional and community characteristics block, we included:

- The Institutional Performance of Area Water Board (IPAWB) index was a composite scale variable that showed how the reform empowered WUAs and FOs to pursue irrigation-related affairs. We asked the respondents, especially how the reform empowered them to pursue irrigation-related affairs, access to information, decision making, and irrigation department personnel conduct related to rent-seeking (please see survey tool sections 15.1 to 15.12 for details).
- Group Dynamics Effectiveness Index (GDEI) measured the group norms and how one individual can relate to himself/herself in the group (please see sections 16.1 to 16.10 for details).
- Community Cooperation Index (CCI) was a composite variable that talked about the measure of trust,

cooperation between different WUAs/villages, trust, and empathy extended from head to tail reach farmers, and how they positioned themselves in such a situation. The level of solidarity/empathy of the watercourse community when some members did not get their due share of water (please see survey tool sections 17.1 to 17.8 for details)

- The level of Participation (LPWUA) in WUA activities was measured from the responses to selected survey questions in sections 13.1 to 13.10.
- The WUA Maturity Index (WUAMI) was measured from selected questions of The WUA/FO Maturity index sections 14.1 to 14.18.

Table 3.6 Descriptive Statistics of Institutional and Community Characteristics

	Name of AWB/ Canal Division							
	Nara Canal		Rohri Canal		Hakra Canal		Desert Canal	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
CCI (1-3)	1.98	0.74	1.59	0.65	1.60	0.42	1.24	0.46
GDEI (0-1)	0.63	0.28	0.31	0.18	0.47	0.18	0.51	0.16
IPAWB (1-11)	5.03	3.92	2.23	2.15	2.24	1.98	1.70	1.52
LPWUA (5-25)	16.77	7.51			12.67	5.14		
WUAMI (15-47)	26.68	11.47			23.44	6.18		

Survey Tool Reliability

The Cronbach alpha, which is the most widely used method for analyzing data reliability, was utilized to examine the reliability of the scale employed in this study. It assesses the question's reliability by determining the mean correlation of the internal consistency as well as elements in the questionnaire. The Cronbach alpha coefficient is a number that ranges from 0 to 1. The measuring scale utilized is more trustworthy if it has a higher alpha value. To ensure that the scale being used is credible, the value of scale items must not be less than 0.70, according to a rule of thumb. The table presented below provides the Cronbach alpha values for different scales used in the survey tool. All scales used in survey tools had a much higher value as compared to the standard one except GDEI, which was marginal.

Table 3.7 Reliability Statistics of the Survey tool scale

Scale Name	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
WSPI	.909	.911	5
CCI	.821	.815	10
GDEI	.725	.721	10
IP	.864	.888	11
TSII	.820	.855	7

APPENDIX B

Key Features of Sindh Water Management Ordinance (2002)

For the full text of the ordinance, see http://sida.org.pk/download/swmo_2002_English.pdf (retrieved 07/05/21)

Governance Level	Operations & Maintenance	Power and Authority	Additional Notable Features	Implementation Assessment
Regulatory Authority (RA)	N/A	- Enforce compliance with the ordinance - Approve all regulations set by SIDA, AWBs, and FOs - Establish AWB performance standards - Establish Customer Service Committees for each AWB to investigate complaints related to FO distributor functions	- Although the RA is supposed to be established soon after the commencement of the ordinance, SIDA may function as the RA until the latter is established - Annual report on the conduct of SIDA, AWBs, FOs, WCAs, and DBGs should be submitted to the government and a summary published in local newspapers in English, Urdu, and Sindhi as well as provide summaries to SIDA, AWBs, and FOs	- RA has the authority to enforce SIDA to comply with the ordinance. However, the RA has not been established as an independent body as per SWMO 2002. Rather, SIDA has been playing the role of RA. Thus, there is a significant conflict of interest that has persisted for nearly 20 years.
Sindh Irrigation and Drainage Authority (SIDA)	- Operate and maintain aspects of irrigation and drainage system within its purview (i.e., barrages, outlets, spinal drains, inter-AEB drains) - Implement flood protection - Receive irrigation water and deliver agreed quantities to AWBs, FOs, and other relevant parties	- Establish Water Allocation Committee (WAC) at each barrage level to determine water shares (i.e., water rights), develop water schedules, ensure discharge measurements are taken correctly, compare planned vs actual discharges, publish information publicly on regular basis, and receive complaints and negotiate priorities as needed - Levy and collect fees, rates, cess, and surcharges from areas outside the jurisdiction of AWBs and FOs - Investigate and solve problems referred by RA - Report non-compliance of AWBs to RA - Provide strategic advice to the government	- Community Advisory Committee (CAC) may be established for "smooth interaction" with communities. - Conduct research studies to appraise options and enhance environmental protection - Manage transition process and support the development of AWBs and FOs	- SIDA never took over control of the barrages. The Irrigation Department still maintains control. -Although SIDA has the authority to operate and maintain irrigation infrastructure, SIDA lacks relevant technical expertise/capacity to have legitimate authority and power to make these decisions. - WACs never fully operationalized: irregular meetings, no meeting minutes, and no publicly posted water schedules. Canal officers (ex-Irrigation Department officials) prepare water schedules rather than WACs. - CACs never established or not functional. - Staff transferred from the Irrigation and Power Department work on the terms and conditions of SIDA but those terms and

				and conditions shall not be less favourable than the terms and conditions admissible to them immediately before their transfer to SIDA.
Area Water Board (AWB)	- Operate, maintain, and improve aspects of irrigation and drainage system within its purview (e.g., main canals, branch canals, drainage tube-well drains with >15 cusecs) - Implement flood protection - Receive irrigation water from SIDA and deliver agreed quantities to FOs and other entitled parties (e.g., industries, wetlands, etc.) - Receive and convey drainage effluent - Monitor surface and groundwater quality - Monitor withdrawals of groundwater - Monitor toxic disposal of effluent - Maintain equipment	- Establish WAC*, if AWB has branch canals such committees are also established at the branch level. - Provide strategic advice to the local and provincial government - Public disclosure of information, including publishing the planning of water distribution, the actual water distribution, and the comparison of the two - Charge fees for services and surcharges for late payments - Reduce irrigation water supplied to FOs for non-payment of water charges by its member(s) - Prevent unauthorized construction and encroachment - Notify RA of toxic effluent offences	- AWBs have a duty not to extend the provision of water supply if doing so fails to meet pre-existing water supply obligations - Support the development of FOs in its command area - CAC may be established for "smooth interaction" with communities.	- WAC Formation at AWB Level is absent. - Only Branch level WAC present whose working is not different from the SIDA level WAC. - Variation across AWBs in performance, but generally weak in terms of information management, analysis, and dissemination (e.g., no publication of planned vs actual water distribution; outdated FO records; fee collection data not readily available in a disaggregated form to analyze compliance by FO; etc.) - Weak enforcement of rules - CAC never established
Farmers Organisation (FO)	- Operate, maintain, and improve aspects of irrigation and drainage system within their purview - Implement flood protection - Receive irrigation water from SIDA or AWB and deliver agreed quantities to WCAs and other entitled parties, ensuring tail-enders and small farmers receive water and drinking water is available - Receive and convey drainage effluent	- Establish WAC* - Provide strategic advice to local councils - FO General Body can decide not to implement the decision of WCA or DBG if doing so would have a negative effect on FO or AWB levels - Charge fees for services and surcharges for late payments - Reduce irrigation water supplied to WCAs for non-payment of water charges by its member(s) - Public disclosure of information	- Support the development of WCAs and DBGs in their command area - Although FO has the authority to decide not to comply with the decision of WCA or DBG, the latter may appeal and seek arbitration by RA - WAC is supposed "to determine (initially on basis of design discharges, evolving to negotiated water rights incorporating the limitations posed by the infrastructural conditions, historic discharges, and market principles) the water share of the WCAs	- WAC never formed at the FO level. - CAC never established

			under "normal water availability" for a weekly interval." (SWMO 2002, p. 29) - CAC may be established for "smooth interaction" with communities.	
Watercourse Association (WCA)	- Operate, maintain, improve, and rehabilitate watercourse, tube wells, lift pumps, field drains, and drainage infrastructure - Receive irrigation water from FO and distribute it to members	- Organize labour for watercourse repairs - Ensure that WCA members contribute the agreed share of labour or money to O&M - Establish water schedules and ensure all WCA members get their due share of water - Assist in "determination and collection of general and special assessment" (SWMO 2002, p. 32)	- Ensuring all members contribute in the agreed manner for their share of labour or money - If WCA Board does not fulfil its water distribution duty, then 1/3 of WCA members may request a caretaker be made available by the FO until new elections can be held	- WCAs must do the manual labour of watercourse maintenance – and they are responsible for ensuring that all members comply – but they do not have authority or power explicitly mentioned in the ordinance to punish those who shirk their responsibilities.
Drainage Beneficiaries' Group (DBG)	- Operate, maintain, improve, and rehabilitate drainage structures	- Organize labour for repairs - Assist in "the determination and collection of general and special assessment" (SWMO 2002, p. 35) - Employ labour and obtain loans and grants	- If DBG Board does not fulfil its duty to collect and dispose of drainage water, then 1/3 of WCA members may request a caretaker be made available by the FO until new elections can be held	- DBGs were never established. - Drainage issues (e.g., salinity and waterlogging) are major problems in Sindh (Sohaq, Mahessar, & Bohio, 2005).

ANNEXURE-C: SURVEY TOOL

Exploring the Water Governance Policy Framework for Improving Participatory Irrigation Management Reforms

Consent Statement

You are invited to participate in a research study "Exploring the Water Governance Policy Framework for Improving Participatory Irrigation Management Reforms" and share your information and experience regarding the irrigation management reforms introduced under the PIDA/SIDA Act 1997. The purpose of this research is to assess the performance of the different irrigation schemes and analyze how you experience the reform process. Your provided information will only be utilized for research purposes and your identification will remain confidential.

Name of Surveyor	Form Number	Date

Identification of Survey Location

Name of Village	Taluka/District/Province	Name of AWB/ Canal Division	FO/Distributary Name	WCA/ Outlet Number

Introductory Questions:

Name of Respondent		
Sex: 1. Male 2. Female	Age:	
Education:	1. No Education 2. Primary 3. Middle 4.High School 5. Intermediate 6. Graduation 7. Post-Graduation 8. Other…….	
Religion:…… Ethnic Group: 1. Sindhi 2. Baloch 3. Punjabi 4. Muhajir 5. Pashtun 6. Saraiki 7.Other…….. Caste: ……..	Did you come after 1947 in this area: 1. Yes 2. No	When did you settle in this area:
No. of Family members:	Working members:' Agriculture: ---------- 2. Non-Agriculture: ----------	

Household occupations/income source	Main:	Other:
Relationship with the Organisation	WUA's	FO
Relationship with FO/WCA		

Landholding:

Landholding (acres)	Total	Irrigated	Un-irrigated
Owned			
Leased-in			
Leased-out			
Total Operated			
Location of distributary at the main canal	Head Reach:	Middle Reach:	Tail Reach:
Location of Water course at the distributary	Head Reach:	Middle Reach:	Tail Reach:
Location of land at the watercourse	Head Reach:	Middle Reach:	Tail Reach:

Land Quality Index

Do you think most of your land is in good condition? 1. Yes 2. No				
Type of Soil (i) Clay (ii) Loamy (iii) Sandy (iv) Other				
The extent of Soil Salinity and Water logging	N/A	High	Medium	Low
Salinity (کلر)				
Water Logging (سیم)				

Water Table Depth (Approximate depth in meters or feet)

Season	This year	Last year	3 years ago	5 years ago	10 years ago	20 years ago
Rainy season						
Dry season						

How much area was Cultivated						

Village prone to drought/floods:

Your farm/village is affected by floods.

1. Agree 2. Somewhat Agree 3. Disagree

Your farm/village is affected by droughts.

1. Agree 2. Somewhat Agree 3. Disagree

Perceived Cropping Intensity:

Year	6.1 How much area did you cultivate during the Kharif and Rabi seasons through canal irrigation?	
	Kharif	Rabi
2021		NA
2020		
2019		
2018		

Do you use Tubewell irrigation for cultivating crops?

1. No'
2. Yes

Year	6.3 How much area did you cultivate during the Kharif and Rabi seasons through tube well irrigation?	
	Kharif	Rabi
2021		NA
2020		
2019		
2018		

Perceived Land Distribution on Water Course and Distributary:

4.1 According to your best estimate at this WC/Outlet how many farmers owned land proportionately in the following categories (acres)					
Less than 2 ( )	2-5 ( )	5-12 ( )	12-25 ( )	25-50 ( )	More than 50( )
4.2 According to your best estimate at this Distributory how many farmers owned land proportionately in the following categories (acres)					
Less than 2 ( )	2-5 ( )	5-12 ( )	12-25 ( )	25-50 ( )	More than 50 ( )

State of Irrigation Infrastructure:

How much do you contribute annually to the maintenance of the distributary? ---------- Rs

How frequent distributary desilting actions are performed (Number/year)? ----------Years

How much do you contribute annually to the maintenance of the watercourse? ---------- Rs

Frequency of watercourse maintenance (Number/year) ----------

Your Source of Irrigation? 1. Canal Water 2. Ground Water 3. Lift From Canal

How much irrigation expenses on average have you concurred annually on Maintenance?

1. Canal water …… 2. Groundwater …… 3. Lift Irrigation ……..

Technical State of the Irrigation Infrastructure (4 = Strongly Agree, 3= Agree, 2= Somewhat Agree, 1= Disagree,

Questions	1	2	3	4
The location & placement of the irrigation structures is technically sound				
The structures & equipment are of good quality				
The structures & equipment are adequate				
The irrigation structures are regularly repaired and well maintained				
Government/ technically trained experts have been always involved				
The water release/distribution is technically well scheduled and managed				
Technical training and guidance are available & provided to all involved				
Do you think the quality of irrigation infrastructure (O&M) under the supervision of FO/AWB is better as compared to irrigation bureaucracy?				

Agricultural Management Performance Assessment:

12.2 Based on your climate and land conditions what are your target and harvested yield of the following crops in the last 5 years? (Please recall your memories)							
Kharif Crops Name	Area Under Crop	Target Yield (Mound/Acre)	Harvested Yield (Mound/Acre)	Rabi Crops Name	Area Under Crop	Target Yield (Mound/Acre)	Harvested Yield (Mound/Acre)
1. Cotton				7. Wheat			
2. Rice				8. Sugarcane (Annual)			
3. Tomato				9. Banana (Annual)			
4. Chilli				10. Canola			
5. Onion				11. Maize			
6. Other				12. Other			

Perception-Based Delivery Performance Ratio:

13.1 How many irrigations turn your crops need and received for the following?					
Kharif Crops Name	Required Irrigation Turn	Received Irrigation Turn	Rabi Crops Name	Required Irrigation Turn	Received Irrigation Turn
1. Cotton			7. Wheat		
2. Rice			8. Sugarcane (Annual)		
3. Tomato			9. Banana (Annual)		
4. Chilli			10. Canola		
5. Onion			11. Maize		
6.			12.		

The State of Participatory Irrigation Management and Farmer Organisation

Questions	WCA		FO	
WCA/WUA Does it exist?	Yes When was it formed?.....		Yes When was it formed?.....	
	No		No	
Are you a member? Yes/No	Yes	No	Yes	No
Do you hold a position?	Yes Position?.....	No	Yes Position?.....	No
What is the selection method	1. Selection by PIDA/SIDA 2. Nomination by few &powerful landholders 3. Consensus of all shareholders, 4. Election		1. Selection by PIDA/SIDA 2. Nomination by few &powerful landholders 3. Consensus of all shareholders, 4. Election	
What is the frequency of the election?				
Did you participate in the election?	Yes	No	Yes	No
Is there any rotation in leadership?	Yes	No	Yes	No
Frequency of meetings	1. Once a month 2. Quarterly 3. Bi-Annually 4. Annual 5. On-Demand		1. Once a month 2. Quarterly 3. Bi-Annually 4. Annual 5. On-Demand	

When was the last meeting held?				
Did you attend?	Yes	No	Yes	No

WUA/ FO Maturity Index:

In general, do you agree or disagree with the following statements? **(1 = Strongly Agree, 2= Agree, 3= Somewhat Agree, 4= Disagree, N/A applies for No opinion)**	1.	2.	3.	4.	N/A
General body members actively participate in the meeting	1.	2.	3.	4.	N/A
Office bearers actively involved and encouraged the member to participate in are the meetings	1.	2.	3.	4.	N/A
What do you think, are the office-bearers educated, and do they lead the group actively?	1.	2.	3.	4.	N/A
What do you think, when elections occurred did all shareholders participate actively?	1.	2.	3.	4.	N/A
What do you think, do the office holders actively pursue the Abiana collection?	1.	2.	3.	4.	N/A
Does any water dispute occur on the WC?	1. Yes			2. No	
What type of dispute generally happens at the WC/Distributary?					
How actively is the WCA/FO leadership involved in the decision-making?	1.	2.	3.	4.	N/A
Do you play an active role in the WCA?	1.	2.	3.	4.	N/A
Do you play an active role in the FO?	1.	2.	3.	4.	N/A
Are you aware of the structure & functioning of FO/WCA?	1.	2.	3.	4.	N/A
Can you recall how many disputes have been resolved so far through WCA/FO leadership?					
Can you recall if FO/WCA ever decided or modified the watercourse irrigation turns?	Yes			No	

Can you recall FO to decide on any new entitlement on your watercourse?	1. Yes			2. No	
If Yes, how many decisions are undertaken recently					
What do you think, do large farmers are dominant in the WCA/FO decision-making?	1.	2.	3.	4.	N/A
How many WCA management committee members have landholding of more than 25 acres?					
How many FO management committee members have landholding of more than 25 acres?					

Institutional Performance of AWB:

Do you think after the reform it is easy to pursue irrigation-related provisions?	**Yes**	**No**
Reform impacted the distributional equity of water among heads and tails.	**Yes**	**No**
Do you feel empowered after the reform?	**Yes**	**No**
Do you think after the reform, the operation and maintenance of the irrigation infrastructure is comparatively better than the previous system?	**Yes**	**No**
How many times did you meet irrigation or SIDA/PIDA officials for the canal and irrigation-related matters?	**Yes**	**No**
Do you experience irrigation officials demanding bribes for irrigation-related matters?	**Yes**	**No**
Do you know someone, directly or indirectly, who has experienced this situation in the irrigation department?	**Yes**	**No**
What is your general perception: has the frequency of such instances reduced after the reform?	**Yes**	**No**
Did you experience any change in the official conduct of the irrigation personnel?	**Yes**	**No**
Do you feel you have better access to the information after the reform?	**Yes**	**No**

Do you feel accountable for the irrigation staff employees for their performance, after reform?	**Yes**	**No**
Do you think after the reform Irrigation staff is more accountable to FOs?	**Yes**	**No**
Do the farmers' groups/organisations generally approach for distributary maintenance or lining?	**Yes**	**No**
If Yes, then what is the mechanism for lobbying Political lobbying 2. Administrative lobbying 3. Others ----------		

Group Dynamics of WUA/FO:

Questions	Yes	N0
Being a member of WCA, I feel a sense of equality in this association, and other members of this group treat me as an equal.		
After revealing that someone is involved in the non-compliance (such as the non-payment of irrigation fee, the free-riding of water turn/theft/not participating in the O&M activities), he/she was still accepted by the group.		
Being a member, I have a feeling that we all have the same type of problems		
Being a member, I have a feeling that large farmers are not getting more benefits from water as compared to me		
Being a member, I have a feeling that head farmers are not getting more benefits from water as compared to me		
Being a member, I have a feeling that officer bearers of this WCA are not getting more benefits due to their position		
Being a member, I have a feeling that officer bearers of this FO are not getting more benefits due to their position		
Being a head farmer, I feel bad when tail farmers do not get water on the water course or distributary		
Do you think the members of this WCA/FO considered helping others without discrimination of caste/ religion		
Do you think the members of this WCA/FO were forgetting self-interest and were always eager to help others		

Community Cooperation Index:

In general, do you agree or disagree with the following statements?	**[Use the following code]** **1=No/Disagree** **2=Neither Agree nor disagree** **3=Yes/Agree**					
	WATERCOURSE			**DISTRIBUTARY**		
Most people who live on this [watercourse/distributary] can be trusted.	3	2	1	3	2	1

In general, do you agree or disagree with the following statements?	[Use the following co de] 1=No/Disagree 2=Neither Agree nor disagree 3=Yes/Agree		
Do the different villages of this distributary work together to solve common problems?	1	2	3
Do the different biradaris of this distributary work together to solve common problems?	1	2	3
Do the different WCA of this Farmers' Organisation work together to solve common problems?	1	2	3
When some watercourses do not get enough water, do the farmers of other watercourses show concern and empathy?	1	2	3
Are people of this watercourse willing to exchange obligations and favours with people of other watercourses?	1	2	3
Are people from other watercourses willing to exchange obligations and favours with people of this watercourse?	1	2	3
Are the leaders of this Farmers' Organisation very concerned when some members are not getting their due share of water?	1	2	3
Do the official of the irrigation department show concern, when members do not get their due share of water?	1	2	3

Hydro-Solidarity:

If there is a shortage at the tail-end of the distributary, how likely is it that farmers at the head-end will cooperate to help tail-enders get water?	
Very likely	☐
Somewhat likely	☐
Not likely	☐

Water Scarcity Perception Index: (1 = Strongly Agree, 2= Agree, 3= Somewhat Agree, 4= Disagree, N/A applies for No opinion)

In general, do you agree or disagree with the following statements?	1	2	3	4	N/A
You face water scarcity on your farm	1	2	3	4	N/A
Farmers on your watercourse suffer crop loss due to insufficient water.	1	2	3	4	N/A
Farmers on your watercourse are receiving "the right amount of water at the right time in the right place" in the Kharif season?	1	2	3	4	N/A
Farmers on your watercourse are receiving "the right amount of water at the right time in the right place" in the Rabi season?	1	2	3	4	N/A
Farmers on your watercourse get enough canal water for irrigation	1	2	3	4	N/A

Market Dynamics/ Integration/Incorporation:

What is the average distance of wholesale markets from your village (Km)?		
Name of the Village	Type of Facility	Average Distance
	Livestock Market	
	Grains Market	
	Fruits/Vegetable Market	
	Govt. Procurement Center	
Distance of village from the retail market (bazaar) and sources of agricultural inputs supplies		
Name of the Village	Type of Facility	Average Distance

	Seeds Shop	
	Fertilizers shop	
	Pesticides shop	
	Bazar*	
Distance of Mouzas from credit facility and its different type		
Name of Village	Type of Facility	Average Distance
	1. ZTBL	
	2. Cooperative Bank	
	3. Commercial Bank	
	4. Commercial Bank (Online Banking Facility)	
	5. Micro Finance Bank	
	6. NGO	
	7. Government	
	8. Aarthi/Commission Agent	
	9. Distance of Mouzas from health facilities	
	10. Distance of Mouzas from the facilities of diesel/petrol pump and depot/agency as well as CNG/LPG	
	11. Distance of Mouzas from the facility of metaled road and transport	
	12. Village to the nearest agricultural workshop to implement maintenance and repairs	
Impact of Agricultural Extension Services on agricultural Performance		
Village Name	Type of Facility	Average distance

	Village to nearest agriculture extension or research office				
20.5 How often do agriculture extension officers visit your village?	1. Monthly	2. Quarterly	3. Bi-Annually	4. Annually	5. Never
20.6 Has the agricultural extension ever organized any farmer field school in your village?	Yes		No		
20.7 Has the agricultural extension ever planted any demonstration plot in your village for the promotion of new technology?	Yes		No		
20.8 Do you think the agricultural extension services help to access the latest production technology and information related to crops?	Yes		No		

Fusion of Scientific Knowledge into Traditional Knowledge:

Which Primary and Secondary tillage instruments do you use for the crops?

Tillage Practice	Yes	No
Laser levelling		
Wooden or Indigenous Plough		
Rotary Plough		
Mouldboard Plough		
Disc Plough		
Chisel Plough		
Disc Harrow		
Rotavator		
Bed Shaper		
Drill sowing		

Cost of Land Preparation per Acre

Tractor (i) Owned (ii) Hired Tractor HP_____										
Activity	**WHEAT**		**COTTON**		**SUGARCANE**		**RICE**		**MAIZE**	
	No	**Per Unit Cost**	**No**	**Per Unit Cost**	**No**	**Per Unit Cost**	**No**	**Per Unit Cost**	**No**	**Per Unit Cost**
Deep Ploughing										
Ploughing										
Planking										
Laser Leveling										
Disc Harrow										
Rotavator										
Ridger/Bed										
Sowing Cost										
Sowing Time Month / Week										
Seed Rate (Kg per Acre)										
Seed Price										

Cost of Irrigation per Acre

Activity	**WHEAT**			**COTTON**			**SUGARCANE**			**RICE**			**MAIZE**		
	No	**Per Unit Cost**	**Application Cost**	**No**	**Per Unit Cost**	**Application Cost**	**No**	**Per Unit Cost**	**Application Cost**	**No**	**Per Unit Cost**	**Application Cost**	**No**	**Per Unit Cost**	**Application Cost**
Canal Irrigation (Abiana Rs/Season)															
Tube well Irrigation															

Fertilizer, FYM, Pesticide, and Weedicide Application per Acre

Activity	**WHEAT**			**COTTON**			**SUGARCANE**			**RICE**			**MAIZE**		
	No	**Per Unit Cost**	**Application Cost**	**No**	**Per Unit Cost**	**Application Cost**	**No**	**Per Unit Cost**	**Application Cost**	**No**	**Per Unit Cost**	**Application Cost**	**No**	**Per Unit Cost**	**Application Cost**
DAP															
UREA															
SSP															
Nitrophos (NP)															
Potash															

Others																
Farm Yard Manure																
Micronutrient																
Weedicide																
Pesticide																
Intercultural Opr. by Machinery																
Intercultural Opr. Labor																

Harvesting and Threshing Cost per Acre

	WHEAT	COTTON	SUGAR CANE	RICE	MAIZE
Harvesting/Picking Cost (Rs)					
Threshing Cost (Rs)					
Transportation if any (Rs)					
Average Yield (Maunds)					
Price per Maund (Rs)					
Price of By-Product (Rs/Acre)					

ANNEXURE- D: KEY INFORMANT GUIDELINE

FO's Chairman/SIDA Mobilisation/ Irrigation official Key Informant Interview Guideline

- What is your opinion about the initial period of reforms?
- What differences have you noticed in community behaviour about reforms in the initial and current periods?
- If it was better in the initial period, then what was the reason behind their good response earlier?
- If it is better in the current period, then what is the reason behind their good response now?
- What is the status of water distribution after reforms? What do you think about the impact of reforms on water distribution?
- Which major interventions have been introduced by SIDA since its formation and what were the results?
- What have been your mobilisation strategies and techniques? Kindly discuss in detail.
- What is the status of water distribution after reforms? What do you think about the impacts of reforms on water distribution?
- Which major interventions have been introduced by SIDA since its formation and what were the results?

- How do you see the interest and response of the community towards reforms and interventions?
- Have you remained successful in controlling water theft? If YES what were your strategies? If NO what were the key reasons for failure?
- How do you see the relationship between SIDA and Irrigation department?
- In your opinion, what are the major reasons behind failed FOs?
- In your opinion, what are the major reasons behind successful FOs?
- In your opinion, what are the major influential factors involved in the working mechanism of FOs?
- What is the election process? How do you elect the members and office-bearers?
- Did the farmers try to bring the power to the grass-root level?
- Are influential people equally accountable for their wrongdoings?
- What do you think about the impacts of reforms on crop production? Kindly discuss the reasons.
- Have you ever tried to convince farmers about the cultivation of more profitable crops? If No, why? If yes what was their response?
- What do you think about the behaviour of irrigation officials towards social parity between deprived and privileged castes?
- What do you think about the behaviour of irrigation officials towards social parity between small and large farmers?
- How do you see the cooperation/helpfulness of irrigation staff? Has it improved after reforms?
- What is your opinion about the SIDA Act 2002? Does it need certain revisions? If yes then kindly define.
- Does SIDA Act 2002 provide enough powers to FOs to control irrigation system? If No, kindly discuss where it lacks.
- What is the major difference between the distributaries/Canals controlled by SIDA and Irrigation department?

ANNEXURE-E VARIATION IN THE CULTURABLE COMMAND AREAS

Sub Div. Name	Areas GCA (Acres)	Rohri Canal Circle (2014 - 15)		Rohri Canal Circle (2016 - 17)		Rohri Canal Circle (2017 - 18)		Rohri Canal Circle (2017 - 18)		Rohri Canal Circle (2018 - 19)		Rohri Canal Circle (2020 - 21)		Rohri Canal Circle (2021-22)
		Kharif 2015	Rabi (15-16)	Kharif 2016	Rabi (16-17)	Kharif 2017	Rabi (17-18)	Kharif 2018	Rabi (18-19)	Kharif 2019	Rabi (19-20)	Kharif 2020	Rabi (20-21)	Kharif 2021
Head	286587.8	233209.5	259719.3	256537.3	260942.9	259783.5	261961.9	244122.3	256230.7	184194.5	246234.0	204072.7	246647.7	156697.7
Middle	761038.9	651018.0	683012.5	623120.5	692301.0	671073.5	673885.9	562953.5	659181.5	567444.9	646389.8	515360.3	645165.9	527617.2
Tail	169963.7	100569.4	127047.6	93621.2	75123.4	65092.3	89362.9	65092.3	89362.9	54649.4	115557.3	84632.4	119568.2	57877.0
Sub Div. Name	Areas GCA (Acres)	Nara Canal Circle (2014 - 15)		Nara Canal Circle (2016 - 17)		Nara Canal Circle (2017-18)		Nara Canal Circle(2017-18)		Nara Canal Circle (2018 - 19)		Nara Canal Circle (2020 - 21)		Nara Canal Circle (2021-22)
		Kharif 2015	Rabi (15-16)	Kharif 2016	Rabi (16-17)	Kharif 2017	Rabi (17-18)	Kharif 2018	Rabi (18-19)	Kharif 2019	Rabi (19-20)	Kharif (20)	Rabi (20-21)	Kharif (2021)
Head	248578.6	172271.1	167645.2	167667.9	35141.0	167159.2	141697.2	139805.3	153129.6	133192.3	160292.0	140343.5	162586.7	148194.1
Middle	264278.1	198776.9	196723.0	148980.9	56970.2	199053.0	134199.0	175942.0	178739.3	156288.0	182517.0	157789.9	178085.4	179303.3
Tail	218400	135147.7	165526.4	129683.8	169479.3	109935.3	107940.1	102622.8	130551.7	102074.6	149809.3	115317.7	141269.1	117170.6
Sub Div. Name	Areas GCA (Acres)	Desert Canal Circle (2014-15)		Desert Canal Circle (2016 - 17)		Desert Canal Circle (2017-18)		Desert Canal Circle (2017-18)		Desert Canal Circle (2018-19)		Desert Canal Circle (2020-21)		Desert Canal Circle (2021-22)
		Kharif 2015	Rabi (15-16)	Kharif 2016	Rabi (16-17)	Kharif 2017	Rabi (17-18)	Kharif 2018	Rabi (18-19)	Kharif 2019	Rabi (19-20)	Kharif (20)	Rabi (20-21)	Kharif (2021)
Head	114272.4	70301.0	95075.5	95300.5	95815.7	99405.6	100904.6	89513.4	94240.5	80205.5	97087.2	79137.4	95753.8	74429.2
Mid	80436.98	65628.3	67859.7	75245.5	70689.2	76662.4	73629.7	71004.3	71706.9	64176.4	72636.3	64380.1	72414.5	59073.1
Tail	88894.77	74564.6	77598.6	78787.3	81946.6	84149.9	83148.3	77456.8	82468.1	71448.0	82800.8	71066.6	82734.8	67239.9

Sub Div. Name	Areas GCA (acres)	Hakra Canal Circle (2014-15)		Hakra Canal Circle (2016-17)		Hakra Canal Circle (2017-18)		Hakra Canal Circle (2017-18)		Hakra Canal Circle (2018-19)		Hakra Canal Circle (2020-21)		Hakra Canal Circle (2021-22)
		Kharif 2015	Rabi (15-16)	Kharif 2016	Rabi (16-17)	Kharif 2017	Rabi (17-18)	Kharif 2018	Rabi (18-19)	Kharif 2019	Rabi (19-20)	Kharif(20)	Rabi(20-21)	Kharif(21)
Head	394624	148718.58	321397.12	266912.37	337592.07	276563.4	311267.1	243131.22	297610.26	174645.9	340430.71	19574585	333206.1	221871.26
Middle	160920	81044.56	121183.21	118372.3	134408.75	121442.6	128801.51	116435.59	125321.26	93394.12	130832.03	92401.8	131604.2	109072.89
Tail	308192	114752.07	209754.28	176139.35	216874.49	189618.8	211473.92	178526.69	205996.74	138274.6	212679.07	137059.24	215976.6	173515.004

ANNEXURE- E ADEQUACY AND RELIABILITY CALCULATIONS

Bahawalnagar Hakra Command Area Actual Evapotranspiration

Seasonal Average Actual ET (mm)											
CCA	Kharif 2015	Rabi (15-16)	Kharif 2016	Rabi (16-17)	Kharif 2017	Rabi (17-18)	Kharif 2018	Rabi (18-19)	Kharif 2019	Rabi (19-20)	Kharif (2020)
Head	844.30	1564.29	562.15	1480.97	1257.60	1450.72	542.56	1535.51	663.00	2001.80	867.69
Middle	854.47	1608.85	631.08	1359.89	1288.60	1516.00	493.31	1438.51	659.81	1923.17	898.12
Tail	818.74	1455.86	582.43	1440.76	1285.19	1508.31	504.18	1420.70	632.80	1825.77	827.00
ETrF											
Head	0.65	2.78	0.44	2.64	0.97	2.58	0.42	2.73	0.51	3.56	0.67
Middle	0.66	2.86	0.49	2.42	1.00	2.70	0.38	2.56	0.51	3.42	0.70
Tail	0.63	2.59	0.45	2.56	1.00	2.68	0.39	2.53	0.49	3.25	0.64

Yearly Average Actual ET (mm)						
CCA	2016	2017	2018	2019	2020	Avg
Head	2126.44	2738.57	1993.28	2198.52	2869.49	2385.26
Middle	2239.93	2648.49	2009.31	2098.31	2821.29	2363.47
Tail	2038.29	2725.95	2012.49	2053.50	2652.77	2296.60

ETrF Statistics			
Standard Deviation		Coefficient of Variation	
(Rabi)	(Kharif)	(Rabi)	(Kharif)
0.40	0.21	0.14	0.34
0.39	0.22	0.14	0.35
0.30	0.22	0.11	0.36

Crop Water Use (2020 -21) [mm]					
Sub Div. Name	Cotton	Sugarcane	Rice	Wheat	Mango
Head	685.109	2506.3387	705.448	1509.321	2609.5926
Middle	567.8414	2340.153	560.65	1314.384	2675.4354
Tail	528.944	2342.145	549.285	1179.801	2604.516

Bahawalpur Desert Command Area Evapotranspiration

Seasonal Average Actual ET (mm)											
CCA	Kharif 2015	Rabi (15-16)	Kharif 2016	Rabi (16-17)	Kharif 2017	Rabi (17-18)	Kharif 2018	Rabi (18-19)	Kharif 2019	Rabi (19-20)	Kharif(20)
Head	905.202	1543.29	856.461	1580.55	1336.48	1579.9894	735.474	1643.26	878.1269	1994.551	1140.514
Middle	782.146	1535.4	641.553	1645.16	1437.12	1652.3092	534.608	1680.48	797.7567	1944.979	1029.092
Tail	397.762	1111.27	309.181	1183.81	1070.86	1224.4488	224.593	1190.22	420.7349	1430.301	599.3102
EtrF											
Head	0.62	2.36	0.59	2.42	0.92	2.42	0.50	2.52	0.60	3.05	0.78
Middle	0.54	2.35	0.44	2.52	0.99	2.53	0.37	2.57	0.55	2.98	0.71
Tail	0.27	1.70	0.21	1.81	0.73	1.88	0.15	1.82	0.29	2.19	0.41

Yearly Average Actual ET (mm)						
CCA	2016	2017	2018	2019	2020	Avg

Head	2399.75	2917.04	2315.46	2521.39	3135.06	2657.74
Middle	2176.95	3082.28	2186.92	2478.24	2974.07	2579.69
Tail	1420.45	2254.67	1449.04	1610.95	2029.61	1752.95

ETrF Statistics			
Standard Deviation		Coefficient of Variation	
(Rabi)	(Kharif)	(Rabi)	(Kharif)
0.28	0.15	0.11	0.23
0.23	0.22	0.09	0.37
0.18	0.21	0.10	0.61

Crop Water Use (2020 -21) [mm]					
Sub Div. Name	Cotton	Sugarcane	Rice	Wheat	Mango
Head	674.755	2650.3761	838.642	1313.127	2747.9051
Middle	588.215	2813.8677	736.92	1150.593	2855.069
Tail	218.1977	2188.851	484.884	631.7314	1806.75

Rohri Command Area Actual Evapotranspiration

Seasonal Average Actual ET (mm)											
CCA	Kharif 2015	Rabi (15-16)	Kharif 2016	Rabi (16-17)	Kharif 2017	Rabi (17-18)	Kharif 2018	Rabi (18-19)	Kharif 2019	Rabi (19-20)	Kharif (2020)
Head	573.965	1335.02	452.687	1202.34	1124.26	1335.0497	311.256	1595.45	842.6365	1817.578	846.38
Middle	1194.56	1332.75	1254.5	1106.03	917.509	1189.8241	1023.74	1365.57	1645.466	1616.127	1429.353
Tail	853.689	670.019	1069.72	515.561	292.195	508.4325	666.806	350.397	1007.418	787.9776	1184.09
ETrF											
Head	0.43	2.00	0.34	1.80	0.84	2.00	0.23	2.39	0.63	2.73	0.63
Middle	0.89	2.00	0.94	1.66	0.69	1.78	0.77	2.05	1.23	2.42	1.07
Tail	0.64	1.00	0.80	0.77	0.22	0.76	0.50	0.53	0.75	1.18	0.89

Yearly Average Actual ET (mm)						
CCA	2016	2017	2018	2019	2020	Avg
Head	1787.71	2326.60	1646.31	2438.09	2663.96	2172.53
Middle	2587.25	2023.54	2213.57	3011.03	3045.48	2576.17
Tail	1739.74	807.76	1175.24	1357.81	1972.07	1410.52

ETrF Statistics			
Standard Deviation		Coefficient of Variation	
(Rabi)	(Kharif)	(Rabi)	(Kharif)
0.37	0.22	0.17	0.43
0.29	0.20	0.15	0.21
0.25	0.24	0.30	0.38

Crop Water Use (2020 -21) [mm]					
Sub Div. Name	Cotton	Sugarcane	Rice	Wheat	Banana
Head	476.265	2013.94	411.787	1244.41	2022.304
Middle	1068.028	2536.954	1167.747	1407.572	2542.668
Tail	437.746	1301.695	587.884	883.464	1387.1293

Nara Command Area Actual Evapotranspiration

Seasonal Average Actual ET (mm)											
CCA	Kharif 2015	Rabi (15-16)	Kharif 2016	Rabi (16-17)	Kharif 2017	Rabi (17-18)	Kharif 2018	Rabi (18-19)	Kharif 2019	Rabi (19-20)	Kharif (2020)
Head	771.597	768.834	821.913	630.63	479.976	648.43922	666.634	731.828	1133.468	988.6579	1115.029
Middle	923.915	698.8	1090.77	520.018	340.876	542.11942	789.049	555.563	1229.972	824.8819	1214.666
Tail	852.173	722.418	1089.84	551.619	329.906	556.20294	693.334	422.89	1098.732	811.8229	1150.832
ETrF											
Head	0.59	1.12	0.63	0.92	0.37	0.94	0.51	1.07	0.87	1.44	0.85
Middle	0.71	1.02	0.83	0.76	0.26	0.79	0.60	0.81	0.94	1.20	0.93
Tail	0.65	1.05	0.83	0.80	0.25	0.81	0.53	0.62	0.84	1.18	0.88

Yearly Average Actual ET (mm)						
CCA	2016	2017	2018	2019	2020	Avg
Head	1590.75	1110.61	1315.07	1865.30	2103.69	1597.08
Middle	1789.57	860.89	1331.17	1785.53	2039.55	1561.34
Tail	1812.26	881.52	1249.54	1521.62	1962.65	1485.52

ETrF Statistics			
Standard Deviation		Coefficient of Variation	
(Rabi)	(Kharif)	(Rabi)	(Kharif)
0.21	0.20	0.19	0.31
0.19	0.26	0.21	0.36
0.22	0.24	0.25	0.36

Crop Water Use (2020 -21) [mm]						
Sub Div. Name	Cotton	Sugarcane	Rice	Wheat	Banana	Mango
Head	848.698	1694.396	862.991	1027.184	1766.9	1990.794
Middle	908.127	1466.767	960.146	919.59	1513.323	1619.13
Tail	649.603	1327.639	718.376	785.789	1239.18	1352.336

PART II

POLITICAL ECONOMY OF DEVELOPMENT REFORM

Policy Briefs

POLITICAL DYNASTIES AND LOCAL ECONOMIC DEVELOPMENT IN PAKISTAN

Faiz Ur Rahman, Noman Ahmad and Muhammad Nasir

INTRODUCTION

Institutional performance in terms of service delivery and economic development has been the centre of recent academic and policy debates. 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. Since politicians move between parties, it makes perfect sense to compare their performances. The families of some of these elected members have been in power for generations, which 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 our study where we scientifically compare the economic performances of the dynastic member with the non-dynast in Pakistan. The study covers all the members of the national assembly (MNAs) who contested in the last three elections, i.e., in 2002, 2008, and 2013.

Pakistan is among those countries where the share of elected political dynasties in parliament is one of the highest in the world. Political dynasties are so entrenched in Pakistan's political system that dynastic legislatures constitute more than 50% of elected politicians since 1970. Before 2008, there was very little debate among politicians on the economic performance of dynast vs. non-dynast legislatures. However, since 2008, the debate has intensified among the leaders of the main political parties. Interestingly, until recently, there was no scientific evidence on which this debate is based.

The local government system is either absent or ineffective in Pakistan, which underscores the role of elected legislatures in local economic development. For this purpose, the parliamentarians are provided access to different types of discretionary development funds. 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 their constituencies. Following the footsteps of Zia, successive governments continued the program under different names. Under this program, every parliamentarian is provided access to funds for developmental projects in their respective constituency. The funds could be used for health, education, electrification, roads, and other types of local infrastructure. [1]

Why does a politician want 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 connections, and loyal voters like baradari. 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 concludes 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 loyal voters, thereby leading to economic development. However, the descendants, who inherit voters, have lesser incentives to ensure economic development. Therefore, the net effect of political dynasties on economic development is ambiguous.

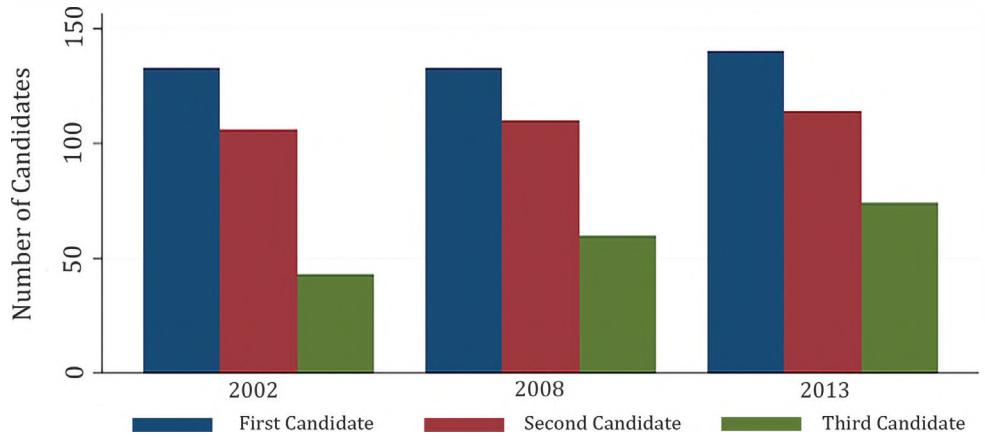
[1] The influence of legislatures in local development can be assessed from the fact that the incumbent government of the Pakistan Tehreek-i-Insaf (PTI) initially put a stop to the allocation of funds to elected politicians (https://www.dawn.com/news/1428660). However, recently, Prime Minister Imran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

DATA AND METHODOLOGY

In the last decade, literature on the persistence of political dynasties has evolved, which describes various features of political dynasties including the way it is defined. Based on this extensive literature, we defined a politician as a dynast if at least one member of his family[2] had been elected as a legislator in the Lower House (i.e., national assembly) of Pakistan.[3]

Figure 1 reveals that about 50% of winners and 41% of runner-up electoral candidates in the national assembly in the past three elections (2002, 2008, and 2013) belonged to dynastic families.[4] These numbers depict the entrenched role of dynastic politics in the electoral process of Pakistan.

Figure 1: Number of Dynastic Candidates among Top Three Contestants of National Assembly



In a country like Pakistan, information on socio-economic indicators at the constituency level is not available. This becomes an impediment to measuring economic growth or development at the constituency level. To overcome this limitation, many scholars resorted to using satellite-based remote sensing, including nighttime lights at subnational levels, as a proxy for economic development. Several empirical studies have concluded a high correlation between electricity consumption and different indicators of economic development (income, growth, poverty, agriculture, and industrial production).

We also used the Pakistan Rural Household Panel Survey (PRHPS), which provides geocoded information on socioeconomic indicators at the constituency level. It includes, among others, 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, and law and order situation. To test whether non-dynast constituencies have better public service provision relative to dynast, we used the close election regression methodology, which minimises the effects of the constituency and individual-specific factors on the probability to win an election.

THE EVIDENCE

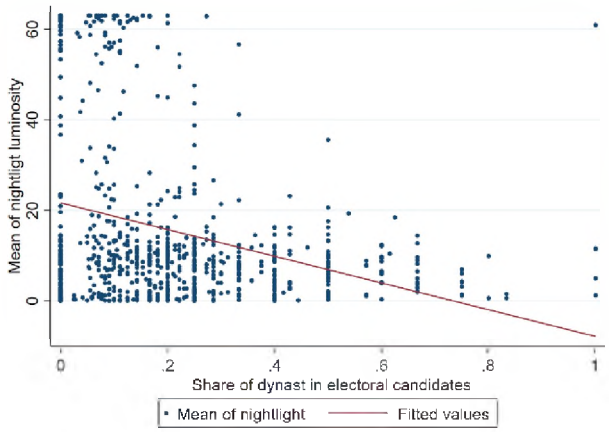
The relationship between local economic development and the share of dynasts in electoral candidates is examined in Figure 2. A lower share of dynast candidates is associated with greater local economic development (Panel A). This suggests that constituencies ruled by dynasts have deteriorated public good provisioning, which results in their lower economic development. This is further supported by Panel B which shows that distance from institutions of public good provisioning such as schools, healthcare centres, etc., reduces the local economic development.

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

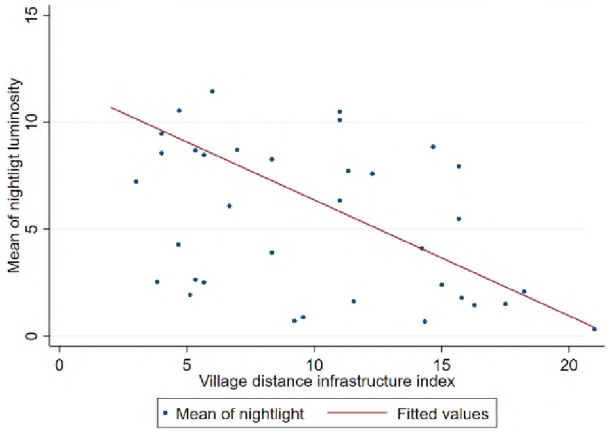
[3] Members of the Upper House are elected indirectly through provincial assemblies. So, they do not exercise their power and influence directly.

[4] For methodological reasons including a 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.

Figure 2: Dynasties and Local Economic Development



Panel A



Panel B

But do constituencies with non-dynast winners perform better than the dynast winners in terms of local economic development? The quantitive analysis shows that a dynastic constituency has one percentage point less electricity as compared to a non-dynast. It is approximately equal to the difference in nightlight between constituencies in the districts of Gujrat and DG Khan; Haripur and Lakimarwat; Tando Ala Yar and Tharparkar; and Quetta and Loralai. Similarly, the constituencies of dynast winners have 10%-25% less access to electricity, piped water, drainage, roads, gas, and telephone and have 21% lower consumption than non-dynasts.

The potential reason for the worse performance of dynasts could be associated with lower political competition and 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 in less effort, which results in underperformance. Moreover, a lack of trust in political institutions reduces political participation, which, in turn, discourages political competition and therefore public service provisioning.

We find that constituencies of a dynast legislature had less political knowledge, lower democratic preferences, and were 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.

POLICY RECOMMENDATIONS

Based on the findings of our study, the following policy recommendations are suggested:

- It is important to mention that the scope of this study is 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. 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 on 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.

OBFUSCATED LIBRALIZATION: HOW SPECIAL INTEREST GROUPS CAPTURE TRADE POLICY IN PAKISTAN

Adeel Malik and William Duncan

Pakistan has one of the most protectionist trade policies in the world. A recent report by the World Bank has argued that the country's trade policy has an anti-export bias, since by affording greater import protection to businesses it incentivizes production for domestic rather than export markets. However, we have little knowledge where the demand for such trade protection comes from. Is it driven purely by economic objectives or is there also a distinct political logic behind trade protectionism? In particular, do sectors exposed to powerful business families and politically connected actors more likely to receive higher trade protection compared to politically unexposed sectors? This question is particularly important for three reasons. Firstly, Pakistan has witnessed substantial tariff liberalization since the late 1990s as tariffs came down from 55% in 1998 to 12% in 2021. Despite such liberalization, there is a significant variation in effective protection rates across sectors. Previous studies have hinted that such variation might be explained by differences in lobbying power. However, this remains to be empirically verified. Secondly, in the wake of its recurring balance of payments problems, Pakistan has frequently tried to reduce its imports by resorting to emergency trade measures, such as the imposition of regulatory duties. Thirdly, the process of trade policy formation in Pakistan is usually ad-hoc, complex, and non-transparent. Trade policy is concessionary, and riddled with exemptions and exceptions. This leaves considerable scope for discretionary application of trade protection. All of this provides strong indication that trade policy might be tilted towards sectors with established businesses who possess greater political capital and lobbying power.

To investigate the politics of trade protection, we compiled a granular database on the presence of politically connected actors in 119 manufacturing sub-sectors of Pakistan. Our political connections dataset maps information on the presence of trade associations, parliamentarians and their business interests, and politically entrenched business families in Pakistan. We combine this political database with product-level data on various measures of trade protection, including tariffs, regulatory duties, additional customs duties, and non-tariff measures (NTMs). Our dataset spans the last two decades covering the period, 1996-2021. We then utilize this data in an empirical strategy that leverages a change in political leadership in 2013 that brought a pro-business political party to power, which signed an IMF programme whose key conditionality centred around trade reform. Coordinating with other multilateral donors, such as the World Bank and Asian Development Bank, the IMF insisted on simplification of tariffs, elimination of statutory regulatory orders (SROs), and the removal of non-tariff barriers (e.g., quotas and restrictions). While the government of the day sought to comply with these requirements, it resorted to other compensatory forms of trade protection. Consequently, the year 2013 saw a major wave of regulatory duties and non-tariff measures. This affected almost the universe of manufacturing sub-sectors. For example, while in 2012 less than 10 percent of total products in the manufacturing sector were covered by NTMs, the ratio increased to 80 percent in 2013.

We leverage the timing of this change in political leadership and an externally-driven attempt at trade reform in a difference-in-differences regression

framework and investigate whether manufacturing sub-sectors that were exposed to politically influential businesses ended up receiving a disproportionately higher level of compensatory trade protection compared to politically unexposed sectors after 2013 (relative to before). The results are instructive. We find that sectors with prior exposure to politically powerful businesses disproportionately benefited from higher regulatory duties after 2013. A similar pattern holds true for non-tariff measures. Sectors exposed to special interest groups (SIGs) represented by strong business lobbies or politically connected firms received a higher intensity of non-tariff protection in the wake of the 2013 trade policy shock. To take a broader empirical sweep at this political economy of trade protection, we estimate a structural model of trade protection that accounts of the role of government-industry interaction in the presence of special interest groups (SIGs). Our results affirm that the presence of SIGs and politically connected actors were an important determinant of the equilibrium level of trade protection in Pakistan. Precisely, we demonstrate that the effect of SIGs kicks in during the post-2008 period, and amplifies after 2013. Our results also reveal a curious empirical pattern that suggests a reversal of trade liberalization during the two decades that form part of our study period. Thanks to declining tariffs, overall trade protection registered a steep decline since 2001. However, the introduction of alternative trade instruments compensated for this fall in tariffs in the following two decades, restoring overall trade protection to the same level as in 2001. Differentiating these patterns by exposure to political influence, we show that politically exposed sectors ended up receiving even higher trade protection than was available to them earlier in the liberalization period.

Our empirical analysis conducted for the RASTA study carries profound implications for understanding the role of political economy factors in trade policy formation in developing countries, in general, and Pakistan, in particular. Our results highlight a partial and hesitant process of trade liberalization where tariff reductions were followed by the introduction of less transparent instruments of trade protection that effectively "obfuscated" the process of liberalization by making it more complex. A complex trade policy, in turn, seems to have benefited politically influential businesses. It is important to emphasize that while the political capture of trade policies is particularly evident after the rise of PML(N) to political power in 2013, it continued unabated despite the change of government and the arrival of Imran Khan's PTI. Such policy continuity highlights the continued access of vested interest groups to levers of power. While political parties compete on the electoral stage through different narratives, the core elite interests are protected regardless of whoever is in power. Public policy debates in Pakistan routinely invoke the term "elite capture" to describe the politics of policy. Our work provides a concrete empirical illustration of how such elite capture works in practice in the context of trade policy. There are also more concrete implications of this RASTA-sponsored research for public policy. The import protection afforded to special interest groups entrenches the anti-export bias of Pakistan's trade policy, which is considered as a major drag on development. In fact, import protection is fundamentally connected with Pakistan's core development challenges, including stagnating exports, declining productivity, and recurring current account imbalances. Pakistan's inefficient policies for import protection support an archaic trade policy regime that effectively functions as a disguised import licensing system, which favours more established and politically influential firms. To address the country's myriad development challenges, Pakistan needs to adopt a simple and transparent trade policy regime. It also needs to discard the use of trade policy for revenue generation. Globally, on average only about 2.3 percent of total revenues are raised through trade taxes. The corresponding ratio for Pakistan still stands at 12 percent.

THE PERSPECTIVE OF NATIVE PEOPLE REGARDING DEVELOPMENTAL PROJECTS OF CHINA PAKISTAN ECONOMIC CORRIDOR (CPEC) IN GWADAR, BALOCHISTAN

Zahid Ali and Noor Salauddin

INTRODUCTION

The enormous benefits of the CPEC for the national economy of Pakistan have been highlighted in the media and as well as academic literature in Pakistan. However, not much is available on how CPEC projects will impact the local population of Gwadar, which is considered to be the epicentre of the CPEC (Abbas, 2019; Dawn, Dec. 01, 2021; Saad et al., 2019). It can also be noted that most of the academic literature and media have focused on the expected benefits of CPEC for Pakistan's economy at the national level, ignoring the cost some people at the local level might have to pay for these benefits. Local people usually show a mix of reactions to new developments. While some people see it as a welcome opportunity, some local people of the same area might see a developmental project as a threat to their indigenous livelihood structure, culture, and identity. Notezai (2021) has observed that local people in Gwadar 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 of the entire development process." The recent agitations by local people in Gwadar (Dawn, Dec 01, 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 to take into consideration the important point that effectively managing the expectations and the concerns of the local people are important factors behind the success of a megaproject. The study on which the present policy viewpoint is based was designed to explore how the local people of Gwadar perceive the various development projects of CPEC, what are the costs and benefits of these projects to the local people, and how can policymakers better manage the concerns and expectations of the local people for maximising the benefits of CPEC.

METHODOLOGY

Most of the available studies on CPEC have taken a quantitative approach, obscuring the genuine voices of the local people. This study was conducted with a people-centric approach by employing qualitative methods with grounded theory as a research design. Intensive fieldwork was carried out in the Gwadar city wherein data was collected through interviews with a total of 64 participants, representing various groups of local people including the fishermen community, people displaced/relocated by the CPEC projects, daily wage labourers, local community leaders and influential, micro-business community, government officials/authorities, and students. A simultaneous process of data gathering and analysis through a constant comparative method was followed for data analysis.

KEY FINDINGS

The major findings of the study are summarised into the following themes, mainly focusing on perceptions, attitudes, and apprehensions of the local people regarding CPEC projects.

- **Vague Knowledge and Mixed Attitude of Local People Regarding CPEC**

Being the epicentre of the CPEC, Gwadar has witnessed a number of mega projects and substantial work is currently going on in the city. Unexpectedly, this study found that most of the local people have very vague and obscure ideas about the various CPEC

projects. While all people knew that "the Chinese are coming to Gwadar," there seems to be a culture of silence and secrecy around CPEC projects; neither the local people seem to be interested to know about the projects nor the CPEC authorities bother much to disclose and publicize the nature of various projects. This has an important impact on the perception and attitude of people as their lack of knowledge makes them susceptible to negative propaganda against CPEC.

- **Expectations and Disappointments of Local People**

The hype created by the government and media regarding CPEC and the comparison of Gwadar with Dubai has led to the development of high expectations among the local people who believed that CPEC will change their lives overnight by proving all types of facilities and opportunities. The level of their expectations was higher in early 2013-2014, which started declining over time. As of now, these expectations are changing to disappointments because their dreams are not coming true, at least in the short run.

- **The feeling of Exclusion among the Current Generation**

Despite their pessimism, almost all of the local people agreed that Gwadar will develop one day and CPEC will bring prosperity to Gwadar city in the long run. However, the local people have developed feelings that they will not see a positive impact in their lifetime. People have witnessed the rapid development of Gwadar city, but at the same time, they feel excluded from the process. Along with this, some participants also pointed out that most of the opportunities provided by CPEC projects are availed by rich people, both local and non-locals, while the poor and ordinary local people are suffering as collateral damage.

- **Development Projects and Opportunities for Local People**

The construction of roads and communication networks is the most visible sign of the CPEC in Gwadar due to which Gwadar is no more an isolated, faraway place. When asked about how has the CPEC changed Gwadar, a daily-wager remarked that "roads, roads, smaller roads, bigger roads being constructed everywhere… and other such things." Similarly, public hospitals, parks, stadiums, industries, etc. are being constructed from which a lot of people will benefit. The CPEC has also promoted tourism in Gwadar, and the real estate business is on the rise. All these developments point out that despite the feeling of disappointment by many locals, there is a light at the end of the tunnel and that the CPEC is right on its way to 'changing the game' in the region.

- **Displacement, Re-location, and Compensation in Gwadar**

Like any other mega-development project, the CPEC has caused what is known as "development-induced displacement." People from several villages have been already displaced and relocated and more people are living through constant fear of displacement. However, contrary to the general perception, it was found that most of the relocated people have been feeling happy and satisfied with the process of relocation and the compensation provided by the government in the forms of cash and alternative land/plots for the construction of houses. In some cases, the local people have willingly accepted the proposal of relocation and their living standard has improved as a result. Overall, the government has successfully managed the relocation issue which should be celebrated as a success story.

- **Illumination of Gwadar and Alienation of Gwadari**

As the hustle and bustle in Gwadar city is increasing due to the ongoing CPEC projects, the local people are feeling a sense of alienation in their native town. There is a lack of a sufficient sense of attachment between the local people and CPEC projects. It was found that local people have been ghettoised to "Old Gwadar" where the living standard is very low and people are faced with issues such as severe shortage of clean drinking water, frequent electricity load shedding, etc. Secondly, the local people of Gwadar are fearful of the rapid demographic change in the city. Some people also pointed out that the local culture is getting eroded and there is no policy for the preservation of the local culture, language and historical places which used to be the identity of Gwadar city. The common perception is that the government is interested in the land (Gawadar) not the people (Gwadari).

- **The Issues of Local Fishing Community in Gwadar**

About 70% of the population's livelihood depends on

marine resources and fishing for the past several generations. They consider themselves to be the true locals and the first casualty of CPEC projects as their lives and livelihoods have been affected in many ways. Some of these people have been relocated by the government away from the coast. Diminishing space for fishing and increasing restrictions on their movement, coupled with the Chinese trawling in the sea has threatened their livelihood.

The findings of the study have led us to conclude that while the future of CPEC and Gwadar is bright, all is not well in the city. The initial high expectations of people from the CPEC development project ultimately led to intense feelings of disappointment. Immediate, short-term, and tangible benefits of a development project play a more significant role in spurring a positive attitude among the local people as compared to indirect and long-term benefits. Lastly, the lack of awareness among people regarding the nature and importance of CPEC makes the local people susceptible to negative propaganda. This knowledge gap is usually filled by vested interest groups/political leaders for their propaganda.

POLICY IMPLICATIONS

Based on the findings, the study recommends the following measures that can help in mainstreaming the local people into the development process.

- **Employment Opportunities for the Natives**

A policy should be in place prioritising the employment rights of the locals in mega projects. The provision of jobs to local people will glue them with the CPEC and will create a sense of belonging, which is currently lacking.

- **Development of Fishing and Marine Life Policy**

Given that most of the local population is dependent on fishing, and given that the marine life is going to be adversely affected by CPEC projects, the government should devise a comprehensive policy and set out priorities for the fishery industry and marine life in Gwadar.

- **Special Developmental Package for the Fishing Community**

The local fisherfolks in Gwadar should be given special attention as they are the most vulnerable and the 'first casualty' of CPEC projects. A special developmental package should be introduced which could include the development of alternative fishing areas, facilitation of fish marketing, provision of advanced fishing technology and training, alternative employment opportunities, etc. The government should try to increase the employability skills of the local people by arranging skill development training for fisherfolks and other local people.

- **Engaging the Locals on the Natures and Purpose of CPEC Projects**

There seems to be a communication gap between the local people and the CPEC authorities. A "community engagement/public relations wing" should be introduced in the CPEC authority for public engagement and countering negative propaganda against CPEC.

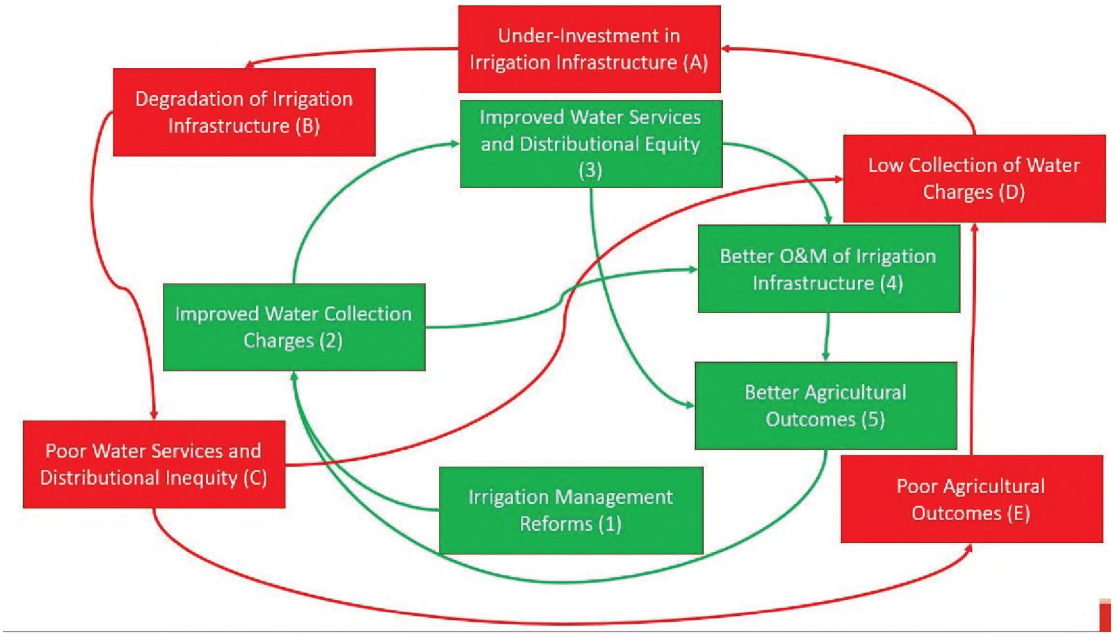
EXPLORING THE WATER GOVERNANCE POLICY FRAMEWORK FOR IMPROVING PARTICIPATORY IRRIGATION MANAGEMENT REFORMS

Muhammad Arfan

INTRODUCTION

Participatory irrigation management (PIM) reform was conceptualised as a panacea for the inept management by the traditional irrigation bureaucracy in the late 1980s. Many developing countries introduced these reforms to overcome the vicious cycle of underinvestment in irrigation schemes. Pakistan introduced PIM reform in 1997 at a pilot scale with the traditional working of irrigation bureaucracy. An initial evaluation of the reform assessment showed promising financial recovery and distributional equity of irrigation water. In 2019, after almost two decades, the Punjab province limited the participatory farmers' institutional working to the watercourse level. In Sindh, these reforms are still practised in limited canal schemes. The literature on participatory reform in Pakistan can be categorised into three strands: (1) reform outputs without critical engagement with local issues; (2) realising the reform implementation challenges but only focusing on one reform player as a villain (i.e., irrigation bureaucracy or farmers agency); and (3) navigate between irrigation bureaucracy and development donor without engaging with policy problem critically. We attempted to critically engage with the reform process and investigated the existing implementation challenges and how the issues associated with bureaucratic hurdles, community inefficacy, and donor participatory development approach reproduce each other in the reform process.

Figure 1: Vicious Cycle of Irrigation Policy Problem and a "Black Box" Theory of Change



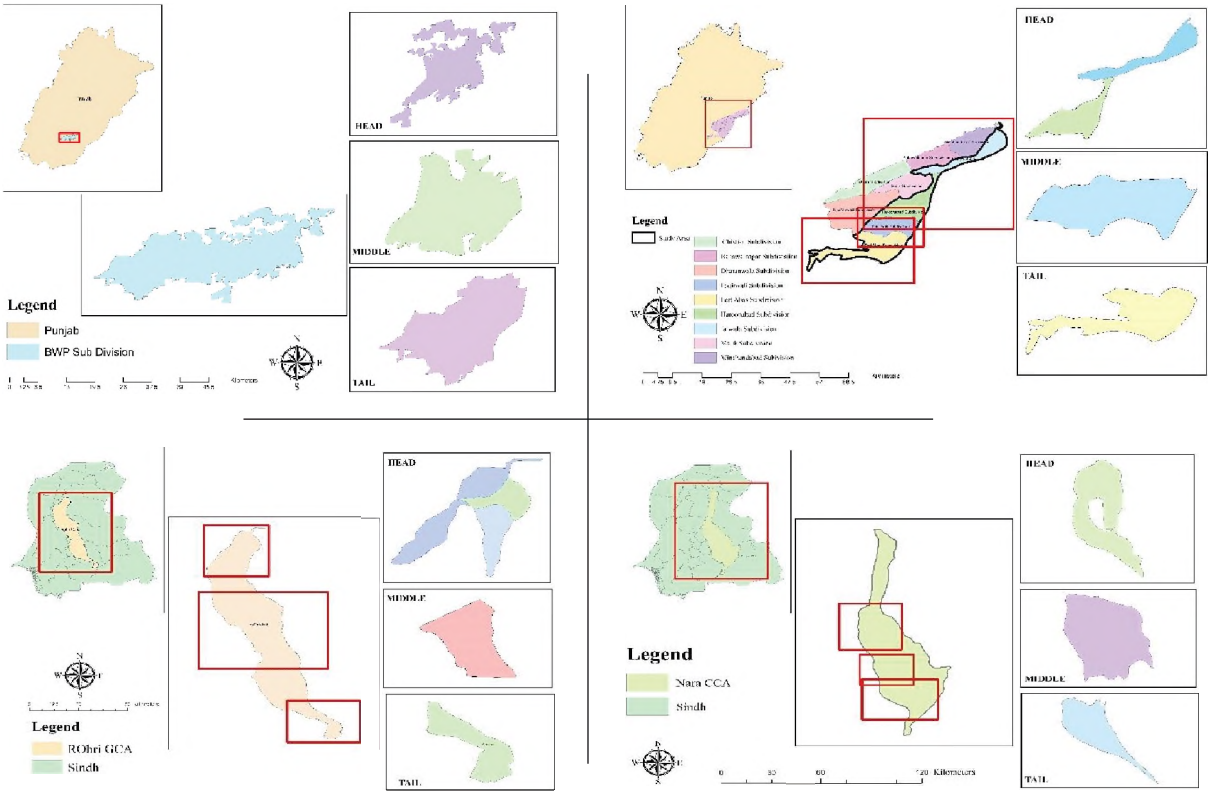
This policy brief is based on the working paper that explored participatory irrigation management reforms in Pakistan and attempted to answer the following research questions:

- How does the reform impact the distributional equity of the system compared to the non-reform area?
- Is the reform able to enhance agricultural productivity in the reform area compared to the non-reform area?
- If there is a difference between agricultural productivity, is it associated with community and institutional characteristics?
- What sort of resource user and resource characteristics play a role in the collective action of the community?
- What challenges did the PIM reform face after its implementation globally and locally?

METHODOLOGY

For comparative purposes, two canals from each province were studied, the one that was managed by the participatory governance system, and the other that was managed solely by the provincial irrigation department. Hakra and Desert canals were selected in Punjab for PIM and non-PIM, respectively, whereas Nara and Rohri channels were selected in Sindh. We used quantitative and qualitative research methods for primary and secondary data collection. Performance indicators were calculated based on remote sensing data and direct production survey estimates. Best-suited performance indicators were applied at the spatial scale of canals (head, middle, and tail) for assessing distributional equity. A survey instrument was developed using ideas and specific question examples from the literature on community cooperation, collective action, technical rationality of irrigation infrastructure, and irrigation management performance. Different scale variables were constructed based on the survey tool responses for hypothesis testing. Moreover, key informant interviews, focus group discussions, and textual analyses of the reform act/ordinances were used for a more holistic understanding of the reform process.

Figure 2: Study Area Canals Selected

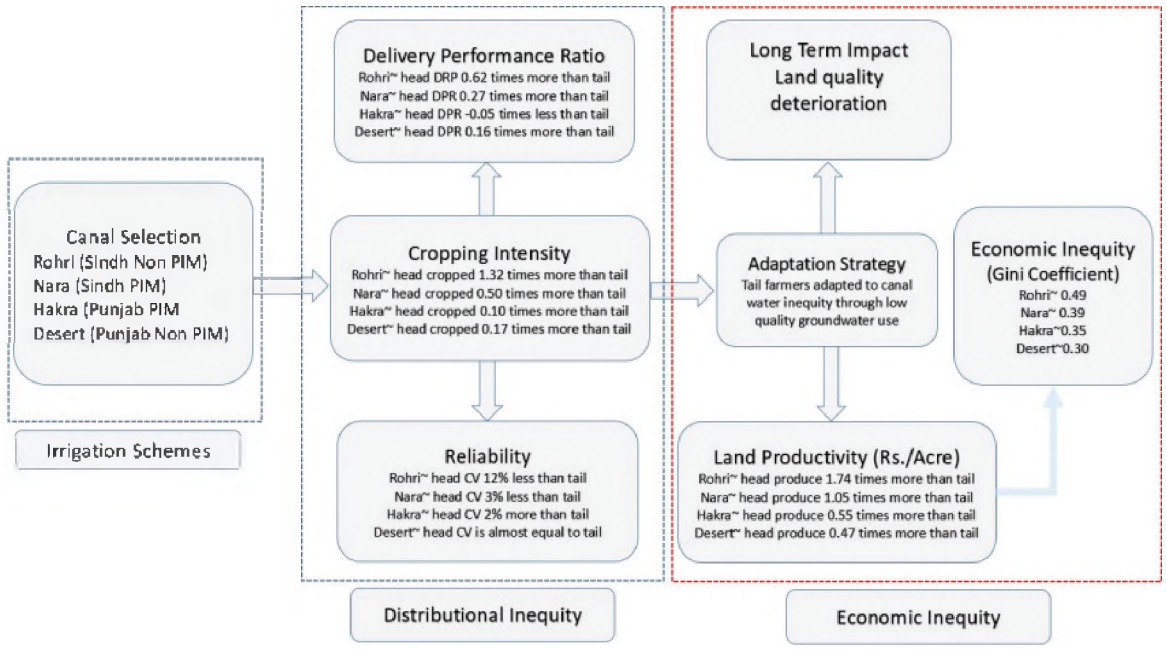


KEY FINDINGS

Part-A: Reform Impact on the Distributional Equity and Farm Productivity

- From the head-to-tail cropping intensity ratio perspective, the reform area in Sindh performs better than the non-reform site, whereas, in Punjab, both canals have performed within the permissible limits.
- Equity in cropping intensity does not translate into water distribution equity between head and tail reaches of Nara and Rohri canals because the head gets more water for high delta crops than tail reaches.
- Overall, the area under cotton crop is declining in both Nara and Rohri canal commands, while the area under sugarcane is increasing.
- The variation in crop choices between head and tail sections leads to inequity in water distribution and agricultural economic returns per unit command area.
- Economic inequity is the result of canal water distributional inequity. When compared to Nara, Rohri has more economic inequity, while Hakra has more variation when compared to the Desert canal.

Figure 3: Summary Evidence of How Distributional Inequity leads to Economic Inequity



Part-B: What Resource Characteristics Explain the Farm Level Economic Divergence and Farmers' Participation in Participatory Institutions?

- Canal regulation-related variables explain 38% variance in the farm-level economic divergence, whereas institutional and community characteristics do not contribute significantly to agricultural farm productivity.
- The institutional performance of the Area Water Board (i.e., empowering farmers' organisation and rent-seeking of irrigation department) have a significant positive relationship with composite irrigation management performance (CIMP).
- Land asymmetry has a significant negative relationship with land productivity and irrigation management performance and reduces farmers' participation in participatory institutions.
- Based on the emic perspective, 56% of farmers considered large landholding members are dominant in the decision-making of Water Users Associations (WUAs) and Farmers Organizations (FOs).

Part-C: What are the challenges that PIM reform faced during the practice globally and locally

- Political demand from below for the PIM reforms were missing from the mainstream political parties' electorate agenda and farmers' organizations' charter of demand.
- Farmers' proactive participation remained low in decision-making due to several reasons, i.e., lack of clarity in authority and power, financial incentive, knowledge, the civic habitus of marginalised sections, and scant understanding of reform bylaws.
- Irrigation bureaucracies hijacked the reform process and amended the initial idea. Irrigation staff does not cooperate with farmers' organisations and undermines the power and authority of new institutions.

Part-D: Content Analysis of SWMO 2002

- A regulatory Authority was never formed. Even after two decades, there has been no formation of a tribunal for dispute resolution.
- SIDA/PIDA never took control of the barrages/headworks for canal regulation, hence WCAs/FOs are completely dependent on the irrigation department.
- The establishment of the Water Allocation Committee (WAC) has not fully operationalised as there are irregular meetings, meeting minutes are not recorded, and there are no publicly posted water schedules. Canal officers still (ex-irrigation department officials) prepare water schedules rather than WACs.
- SWMO (2002) does not explain how SIDA and AWB officials will be made accountable to farmers' bodies in lower tiers. Farmers' representative tiers (WUAs/FOs) have more responsibilities than power and authority. There is no financial incentive for farmers' representative functionaries in tiers (WUAs/FOs). There are no behavioural nudges for tier (WUAs/FOs) for irrigation service fee collection.

POLICY RECOMMENDATIONS

Based on the extensive literature review for global case studies and local-level policy implementation, key issues were identified based on data evidence and key informant interviews with stakeholders. We propose a set of recommendations for each policy issue that needs to be considered for improving the PIM.

Issue 1. Weak enforcement of the law, including the Sindh Water Management Ordinance (2002)

Participatory Irrigation Management (PIM) reform has not been fully implemented, and its full implementation requires some adjustments and innovation at the local level, which include:

1-A. The Sindh Water Management Ordinance (SWMO 2002) has not been fully implemented. We recommend the establishment of a regulatory authority for dispute resolution and an oversight role in the working environment of SIDA.

1-B. Irrigation department personnel who come under the jurisdiction of FOs or clusters of FOs need to be accountable to the FO's chairman.

1-C. There is a need to introduce changes in the water rights regimes. The clustering of FOs/WCAs can establish local water markets and share the water rights accordingly to improve the canal schedule.

Issue 2. Institutional integration, pooling of resources, and revitalization of irrigation departments

2-A. Agriculture extension department has a union council level presence, its staff is underutilised, and its scope of work is saturated. It needs to be revitalised as a "water and agriculture extension service" provider with an updated curriculum. It needs to be coupled with participatory institutions for a better outcome.

2-B. The existing functions of key departments, including PIDs, should be restructured and reformed via a transition from an engineering-only solution to a water resources, engineering, and management approach through the induction of experts of diverse backgrounds and the development of cross-sectional/inter-organizational coordination.

The monolithic structure of the human resources of these institutions limits their working efficacy. Thus, these departments must be professionally diverse.

Issue 3. The maintenance of information management and sharing systems is an important pillar of PIM that appears to have been neglected

3-A. There is a need to introduce behavioural nudges in SWMO 2005 for the better performance of FOs in irrigation service collection. Different slabs need to be present on a pilot scale.

3-B. The digitisation of the canal network needs to be augmented with the real-time maintenance of canal flow data for transparent monitoring purposes.

3-C. Localised decision-making might be difficult in a contested environment. Therefore, irrigation officials must build capacity to encourage FOs' inputs and collaboration with FOs.

Issue 4. Problems with direct outlets, lift machines, changing cropping patterns, and distributional inequity

4-A. The practice of direct outlets and lift machines is not allowed in any case, and existing facilitation needs to be incorporated within the irrigation network. These political bribes ultimately cost the poor and marginalised.

4-B. It was observed that changing the cropping pattern towards high delta crops causes distributional inequity between the main canal's head and tail reaches as well as at the distributary scale. This issue of distributional inequity can be easily addressed by establishing agroecological crop zones in each region with stakeholder consultation and FO compliance.

Issue 5. Land asymmetry affects irrigation management performance and the institutional working environment of participatory institutions

5-A. The elite capture phenomenon has historical and structural (or institutional) roots, but it is mostly manifested by the small peasantry's passivity. To effectively deal with this issue, a more politicized participatory model for community mobilization and involvement is required, which will challenge the social and institutional hierarchy.

5-B. WUAs/WCAs need to provide more institutional support, such as community-owned agriculture implements cooperatives, small storage houses for harvested commodity handling, collective marketing of agricultural produce in the market, and small loan schemes through WUAs/WCAs, and other community services to improve collective action and trust among different groups. These trust-building measures enhance community integration, which ultimately enhances irrigation governance at a local level.

5-C. On a more radical note, targeted land reform (for optimal farm size) needs to be introduced to overcome the negative consequences of exceptionally large and small farm sizes' impacts on farm productivity.

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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 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 research focus on Pakistan's public policy issues relevant to the themes/topics of each round can participate in CGP.

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