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Key Binding Constraints on Green Industrializationin Pakistan

A Background Paper

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Introduction

Pakistan is in the midst of a grave economic and financial crisis. The ongoing macroeconomic instability, as Pakistan teeters on the brink of default under a mountain of domestic and foreign debt, follows on the heels of the crises created by the Covid-19 pandemic, the Ukraine war and unprecedented rains and flood in later part of 2022, dealing a serious blow to an economy beset with deep structural problems.

Pakistan is among the top ten most climate vulnerable countries, experiencing long term weather changes and is frequently hit by heatwaves, droughts, excessive rains and floods. Its 2022 floods have been particularly severe as its southern parts still remain under water even after five months. Hence it was no surprise that Pakistan was discussed both in COP 27 and in the discussion on debt relief as one of the 20 countries most vulnerable to debt-related severe financial instability.

The natural and human resources of Pakistan are under severe stress due to the development model which has not valued negative social and environmental externalities such as higher levels of pollution, global warming and the potential loss of environmental habitats. On the road to green transformation, Green Industrialization is one of the critical pathways. Pakistan may have been facing the burden of rising global temperatures and attendant climate change-related shocks despite being a minor contributor to GHGs. And it has little choice but to upgrade its climate policy for its own citizens. The global economy is also fast shifting to a carbon neutral growth path and some countries/regions like EU are going to introduce restrictive practices like Carbon Border Adjustment Measures, which need a concerted policy response.

Pakistan followed a policy of rapid, import substituting industrial development immediately after its creation in 1947. Pakistan's manufacturing sector expanded very rapidly and became one of the major sources of formal employment and exports. Industrial Policy (IP) in Pakistan has been a driving force in the development planning of the country, well into the 1970s as a priority of the state; the government itself taking an active part in the process of industrial process. The government established Pakistan Industrial Development Corporation in 1952 to set up the industrial base. Pakistan Industrial Finance Corporation (PIFC) and Pakistan Industrial Credit and Investment Corporation (PICIC) were established in 1948. To fill the skill gap, the Swedish-Pak Institute of Technology was established in 1955and Pakistan Industrial

Technical Assistance Centre (PITAC) was established in 1956. As a result, the share of manufacturing increased from 3 % in 1949 to 13 % in 1969 with an annual growth rate of 14 %. In 1970s. The government went for large scale nationalization of the industry and promoted small scale industries by establishing Industrial Estates all over the country. From the 1980s, however, Pakistan adopted the policies of denationalization, deregulation and privatization. Pakistan was one of the founding members of the WTO and started liberalizing the key service sectors like energy, banking, logistics, ICT from the 1990's onwards and established regulatory authorities and consumer protection institutions to manage the interface between state, markets and society. The industrial development institutional infrastructure also reflected this transformation and Pakistan stopped having an Industrial Policy per se. The first decade of the 21st century did witness relatively rapid growth in exports but the competitiveness of Pakistani industry could not keep pace with its competitors and the manufacturing contribution to GDP started falling and exports became stagnant.

Pakistan has been facing a rather rocky growth trajectory, experiencing boom and bust cycles at regular intervals starting in 2008, in the recent past followed by severe macroeconomic instability in 2013 and 2018. Since mid-2022, Pakistan has been in the midst of a multi-faceted macroeconomic crisis, with its forex reserves down to an historic low of $ 3.4 billion at the end of January 2023. Caught in a vicious boom and bust cycle, with inflation running at 35 % towards the end of 2022, 30% of Pakistanis now live below the poverty line, compared to 24 % in 2019. [UNDP 2020] Unemployment has risen sharply, standing at an historic high of 7.8 % as compared to the average of 5.44 % from 1985 t0 2021, with many sectors struggling laying off large number of employees. [PBS 2021] Pakistanis are living in seriously degraded environment and climactic conditions. Paltry income transfers to the ultra-poor do not provide an adequate safety net. In the wake of the ongoing crisis, there have been growing calls to re-focus on industrialisation. In this regard, successful Green Industrialization can become a harbinger of a much-needed turn around and transition to green economy, defined as low-carbon, resource-efficient and socially inclusive. The importance of the green economy[1] is not lost to the policymakers as such but the relationship between Climate Policy and Industrial Policy in Pakistan has been rather fragile.

[1] Green Economy [definition taken from UNEP] is defined as an economy where the growth in employment and income are driven by public and private investment into such economic activities, infrastructure and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services.

With an increased awareness of the environmental impact of industrial development, it became apparent since 1970s [Pakistan established a Ministry of Environment in 1975] that industry needed to do more to strengthen the environmental and social pillars of development. The emergence of a robust climate policy, which could become a vector of green growth in Pakistan, is taking time, despite the presence of a sorry state of ground reality as noted by the last Economic Survey of Pakistan 2021-2022 in the following words:

‘’In Pakistan, the environmental degradation and climate change are adversely affecting the economy, livelihood of the poor and sustainable development. On the one hand, growing population, unplanned urban expansion and dependence on natural resources puts immense pressure on environment…. Moreover, lack of public awareness regarding environmental issues and mismanagement of water and solid waste has aggravated the situation. Consequently, Pakistan continues to suffer from a plethora of natural and human induced hazards that threaten the lives and livelihood of its citizens – natural disasters including floods, earthquakes, landslides, cyclones and drought.’’ (PES 2022: Ch. 16 page 1)

The same Economic Survey states that Pakistan has yet to make a National [Climate Change] Adaptation Plan,

‘’Pakistan is in the process of developing National Adaptation Plan (NAP) for building resilience to climate change. NAP is widely seen as one of the most important mechanisms to cope with the challenges of climate change. The core objective is to reduce vulnerabilities to climate impacts by creating comprehensive medium and long term plans including the integration of adaptation measures into the national policy. Pakistan will use the NAP process and its outcomes to enhance the adaptation elements of the Nationally Determined Contributions (NDCs), which is the central aspect of the Paris Agreement. The NAP Process will be in place by June 2023.’’

The recent floods have affected 33 million people with more than 8 million people displaced, and pushing 8 to 9 million into climate-induced poverty.[2] Realizing the growing incidences and socio-economic fragility, the government has increased expenditures on social protection as shown the economic survey 2021-22. According to the economic survey the poverty rate of

[2] World Bank, *"Pakistan: Flood Damages and Economic Losses Over USD 30 billion and Reconstruction Needs over USD 16 billion,"* 2022. https://www.worldbank.org/en/news/press-release/2022/10/28/pakistan-flood-damages-and-economic-losses-over-usd-30-billion-and-reconstruction-needs-over-usd-16-billion-new-assessme#:~:text=The%20assessment%20estimates%20total%20damages,reach%20about%20USD%2015.2%20billion.

the urban and rural population were 11% and 28% respectively.[3] Increased spending on social security and welfare in FY2022 was Rs 257,031 million, compared to Rs 173,443 million in FY2019, but less than FY 2021 when it was Rs 280,258 million, due to shrinking fiscal space on account of pressures created by the domestic debt payments.[4]

Realizing that Pakistan needs industrial growth that is both environmentally and socially sustainable, UNCTAD has included Pakistan in its Project to help a selected number of developing countries to develop effective strategies for green transformation. This Paper identifies the key binding constraints on Pakistan's prospects of green transformation through green industrialization, guiding the final design of recommendations to help Pakistan promote green industrialization.

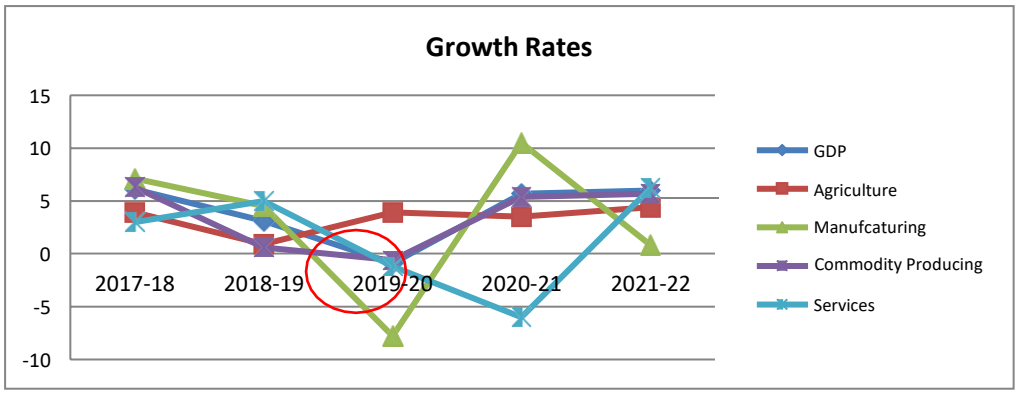
The Background Paper is divided in 4 Sections. Section 1 sets out the general economic context. Section 2 provides a brief historical survey of recent industrial development policies in Pakistan. Section 3 discusses the role and impact of climate change policies on Industry. Section 4 is about the binding constraints on the green industrialization in Pakistan. This section aims to frame the key challenges of green industrialization, which should enable us --- after the sectoral and cross-cutting studies are done --- to propose a framework of integrated strategies, , to support decision makers in facilitating green transformation aided by the new climate model of Pakistan's economy.

[3] Pakistan Economic Survey, 2021-22
[4] Ibid.

Section I: Setting the General Economic Context

Pakistan, a low-income country (1505 USD per capita; WBG 2022) , with a 229 million population, has been growing in fits and starts, particularly in the past three decades. More recently, GDP hit a low point of – 0.38 in 2019-20 due to the Covid-19 pandemic, according the Economic Survey of Pakistan 2019-20. All sectors of the economy were hit, manufacturing being the worst. The economy recovered quickly from a rather short economic lock-down from 2020 onwards. The agriculture sector showed a positive growth rate of 4.4%, manufacturing 9.8%, the commodity sector 5.7%, and the services sector increased to 6.2% towards the end of the financial year 2021-2022, when the last Economic Survey was published in May 2022, as shown in the table below.

Figure 1.1



Source: Pakistan Economic Survey 2021-2022

The ‘boom and bust’ cycles, the procyclical movements and counter-cyclical measures have become an abiding characteristic of Pakistan economy but it appears this time the recovery would be extremely hard and may erode the social development gains of many years and put further pressure on the ecology, as this time, as compared to the busts of 2008, 2013 and 2018, the external sector is in a bigger trouble due to the fall out of the Ukraine war and the acceleration in the accumulation of debt. The cumulative impact of these expansionary policies in the form of domestic and foreign debt-burden is such that sovereign default could only be averted by a draconian reform effort under the IMF Programme being negotiated these days. The forex of Pakistan has gone dangerously to the low level of $ 4 Billion in January 2022, inflation at the historic high of 35 % and rupee losing its value massively against the USD. Rapidly depreciating rupee has made imported energy and food highly unaffordable. Despite very high interest rates [of 20 %] and severe import controls, the inflation is not going down

and the forex is not recovering as the country awaits a new IMF Programme. The structural problems of Pakistan have become intractable with such a deep economic down-turn never experienced before. The origin of the current bust-boom-bust-possible default could be traced to 2017. Since 2017, Pakistan has the third government these days. Though the second government has to face the Covid and the third government is facing the impact of Ukraine war, yet the faultiness of the development model are the same as the ones which triggered the busts in 2008 and 2013. Digging deeper would help us better understand the nature of structural problems Pakistan has been living with.

The new government in August 2018, inherited two major challenges i.e., unsustainable Current Account Deficit [CAD] and a volatile exchange rate as the previous government tried to keep the value of rupee against dollar under the state control, which led to the overvaluation of the rupee, high imports, and unsustainable twin deficits of CAD of $ 7,413 million coupled with Fiscal deficit of Rs. 1,480 billion.[5]

As the economy adjusted to the new dollar-rupee parity [Rs. 80 to 1 USD in Fe, 2017 to Rs. 138 to USD 1 in Feb. 2019] and stabilization ensued with IMF Programme in July 2019, signs of recovery were apparent in late 2019. when COVID-19 Pandemic led to an economic lockdown in late March 2020. However, Pakistan closed its economy only for a short while and the output contracted only for two quarters. There were prolonged lockdowns in some of its export markets but the impact was not steep as the export loss in some categories was compensated by the increase in the export of ICT. A problematic area however was that the government resorted to an expansionary policy too soon after the last episode, due largely to Covid, which also saw the suspension of the IMF $ 6 billion programme under the Extended Fund Facility[6].

The consequent recovery was still fragile when the Ukraine crisis hit with the energy prices and commodity prices shock. Out of $ 1 Billion wheat imports during 2021, wheat worth $594 was imported from Ukraine. The markets of, LNG, coal, and oil have been roiled up by the Ukraine war. The bilateral trade between Ukraine and Pakistan in 2021 stood at USD 800

[5] "Monetary Policy Information Compendium," State Bank of Pakistan, January 2018.
[6] "IMF Executive Board Completes the Combined Seventh, and Eighth Reviews of the Extended Fund Facility for Pakistan," IMF, 2019, https://www.imf.org/en/News/Articles/2022/08/29/pr22293-imf-executive-board-completes-reviews-of-extended-fund-facility-pakistan#:~:text=The%20EFF%20was%20approved%20by.

million[7], with $ 739 Million worth of imports from Ukraine. Due to the Ukraine war, Pakistan has been compelled to look for alternative suppliers. Due to the shortage of energy inputs the country has been facing power outages.[8] There is a capacity in the system to produce the electricity but producing all the energy that Pakistan needs increases the energy import bill and the circular debt.

As the Ukraine war continues, keeping energy and food prices high, the provision of subsidies by the government to keep the prices low and the high import bills pushed Pakistan into a serious macroeconomic instability, despite a strong GDP for the whole year i.e., 2021-22. In other words, growth performance was short-lived with negative long-term implications for the coming years. The new government, which came to power in April 2022, hesitated to reverse the expansionary policies and continued subsidizing petroleum products with ballooning deficits. Fearing a public backlash on the IMF imposed conditions [ending subsidy on oil and adopt austerity and external sector liberalization] the macroeconomic crisis continued to worsen. During these months the floods also hit. The floods caused a loss of GDP of about 2 %, leading to an expected contraction of the agricultural sector of 0.9 % of GDP, and damaging infrastructure valued at $30 billion.[9] Almost 15% of the country was underwater, 1300 km of roads and 440 bridges have been destroyed, with estimated damage to $14.9 billion and a total economic loss of $15.2 billion.[10] As the country goes to the IMF, after accepting all their conditions in January 2023, the World Bank's forecast is that the country will grow merely by 2% as compared to 6% last year.[11]

In the 'boom and bust' story of Pakistan's growth, the soundness and timing of economic decision-making, governance reforms, and the implementation capacity of the state institutions, play a critical role, particularly so, when the stakeholders in the status quo, , may be erecting roadblocks to the reform. .

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[7] Tehseen Ahmed Qureshi and Abdul Wajid Rana, "Pakistan: Impacts of the Ukraine and Global Crises on the Economy and Poverty," Global Crisis Country Project Paper, Washington, DC*: International Food Policy Research Institute*, October 2022, https://doi.org/10.2499/p15738coll2.136406.

[8] Ayesha Mirza, "Ukraine, Russia war: implications for Pakistan," *The Express Tribune*. 2022. https://tribune.com.pk/story/2364775/ukraine-russia-war-implications-for-pakistan

[9] "Pakistan: Flood Damages and Economic Losses Over USD 30 billion and Reconstruction Needs Over USD 16 billion - New Assessment," World Bank, October 28,2022. Press release. https://www.worldbank.org/en/news/press-release/2022/10/28/pakistan-flood-damages-and-economic-losses-over-usd-30-billion-and-reconstruction-needs-over-usd-16-billion-new-assessme#:~:text=The%20assessment%20estimates%20total%20damages,reach%20about%20USD%2015.2%20billion

[10] World Bank, "Pakistan: Flood Damages and Economic Losses"

[11] World Bank, "Overview," World Bank, 2022, https://www.worldbank.org/en/country/pakistan/overview

Pakistan has been suffering from a perennial saving-investment gap. A low saving and investment rate[12] hovering around 15% since the 1960s[13] is directly responsible for the lack of structural transformation of Pakistan's economy. According to the State Bank of Pakistan, the investment rate, which averaged at 18% in 2000s has come down to 15 % on average during the last decade. With such low investments [including FDI in manufacturing], technological transformation is slow and the economy remains stuck with producing low value-added products. Unable to mobilise private sector investment, the government has been accumulating huge debts. Pakistan has been experiencing stagnant exports, [Pakistan exports were $ 25 Billion in 2011-2012 and still $ 25 Billion in 2020-2021], mainly due to lacklustre performance of the manufacturing sector. Pakistan witnessed historically high imports, of $ 80 Billion during 2021-2022, with a trade deficit of $48 billion, on the heels of expansionary policies [Fiscal deficit to GDP ratio during 2021-2022 was 9 %]. In these circumstances, the management of exchange rate policies has been Pakistan's Achilles heel, triggering the bust. At the same time the fiscal side of the government has been highly flawed with tax to GDP ratio standing at a low of 9.2 % in 2021-2022. Fiscal indiscipline and subsidies prop up inefficient public sector enterprises, particularly in the power sector [which accounts for Rs. 518 out of the total subsidies of Rs. 577 in 2022], fertiliser, petroleum and agriculture and support a huge public sector. [Economic Survey of Pakistan 2022]

A full-blown crisis is upon Pakistan as the negotiations for an IMF bail-out kick in. Already, the administrative measures put in place to control imports are harming local manufacturing and exports. Industrial activity is fast shrinking and real rate of inflation in the economy is expected to be about 42.5%.[14] The options for 'better' financing are restricted for Pakistan due to continuously deteriorating Credit Rating of Pakistan, standing at CCC- by Fitch in Feb 2023] , notwithstanding the UNCTAD plea for debt restructuring and other gaps should be addressed in more sustainable ways, creating coherence between the socio-economic development.[15] The government is trying to get the economy out of a melt-down like situation with the help of IMF and other lenders and donors, who are willing to help if Pakistanis are ready for a serious reform. Pakistan would be in a good position to address some of its structural problems in the

[12] Amjad Ali, *"Saving and Investment in Pakistan"*, State Bank of Pakistan, 2016 https://www.sbp.org.pk/publications/staff-notes/SavingInvestmentStaffNote-Jan-16.pdf
[13] "Pakistan: Capital investment, percent of GDP," The Global Economy, 2021 https://www.theglobaleconomy.com/Pakistan/capital_investment/
[14] "Monetary Policy Information Compendium," State Bank of Pakistan, January 2023.
[15] UNCTAD, "Financing for Sustainable Development Report 2022," Development Finance, 2022, https://developmentfinance.un.org/fsdr2022.

short to medium term with the relevant stakeholders working together to develop realistic and complementary climate and industrial development policies, which in turn can bring in more sustainable modes of development and financing, reducing the severity of pro-cyclic movements.

Section 2: A Historical Survey of Recent Industrial Development Policies in Pakistan

2.1 Overview of Pakistan's Manufacturing Sector

The manufacturing sector in Pakistan is divided in three categories i.e., Large Scale Manufacturing [LSM], Small Scale Manufacturing [SSM] and Slaughtering. LSM is defined as an establishment that employs ten or more employees.[16] The performance of LSM is measured through Quantum Index of Manufacturing (QIM)[17], and Census of Manufacturing Industries (CMI).[18] In FY 2021-2022 the LSM share in GDP was 7.2 %. LSM dominates the manufacturing sector with a share of 74.3%.[19] For statistical purposes, the LSM is comprised of 22 sectors dominated by the food industry, textile & clothing, fertiliser, auto-sector, cement and chemical industry, tobacco industry, petroleum industry, paper and paper products, Leather, IT, agricultural machinery etc. The industrial and household units engaged in manufacturing activities, which have less than ten employees, are classified as small-scale manufacturing. The share of small-scale manufacturing in GDP was 2 % and sectoral share was 15.9% in FY 2021-2022.[20] The SSM includes textile cottage industry, handicrafts, sports goods, and etc. Slaughtering is measured through value addition of output products like meat, hides, skin, bones, and blood etc.[21] The sector's share in GDP in FY22 is 1.2% and sectoral share is 9.7%.[22] The slaughtering includes the meat industry.

The manufacturing sector of Pakistan after witnessing impressive growth in the first five decades of Pakistan is now in decline. Manufacturing contributes merely 12 % to GDP and its base is rather small. The competitiveness of Pakistan's manufacturing is under a serious question. There is premature de-industrialization in Pakistan, with grave consequences for Pakistan's growth, exports, imports and jobs. Due to China-Pakistan Economic Corridor, the availability of efficient green technologies, unsustainable imports, there is an expectation of new manufacturing coming up, with a suitable policy environment and governance.

[16] Ministry of Finance, Pakistan Economic Surveys.
[17] QMI: measure the production of LSM over time. Pakistan Bureau of Statistics
[18] Ibid,2021-22
[19] Ibid.
[20] Ibid.
[21] Pakistan Economic Survey, 2021-22 and 2020-21
[22] Pakistan Economic Survey, 2021-22

2.2 Industrial Policy in Pakistan and its Discontents

Pakistan has a long history with Industrial Policy, unfolding in a specific historic context. Pakistan's story of state led industrialization since 1947 is well-researched. The Pakistan State is credited with rapid establishment and expansion of an industrial base, with the help of the institutions like Pakistan Industrial Development Corporation, established in 1952. Pakistan could significantly substitute imports and gradually developing pretty large export-oriented agro-based industries like textiles and leather. During the period from 1948 to 1972, the government used different policy tools to restrict imports, established local industry with government support and promote exports with different schemes. The rapid industrial growth also resulted in the concentration of the sources of production in fewer hands, which was resented and Pakistan entered into a different planning paradigm from the early 1970's, which is reviewed in greater detail below.

2.2.1 Nationalization and Economic Reforms Order (NERO) during 1972-1977

After 13 years of direct army rule, Zulfiqar Ali Bhutto became the president of Pakistan. Deeply influenced by the global trends during the later 1960s, Bhutto came to power with socialist policies that had three aspects: the means of production on which industrial progress and other industries rely, must not be vested in private hands, hence all firms that contribute to the national economy infrastructure must be public, and institutions dealing with mediums of exchange (i.e., banks) must be nationalized.[23]In 1972, the process of nationalisation began in the country. The large-scale manufacturing in capital and intermediate goods sectors were nationalised, followed by the nationalisation of vegetable oil, cotton ginning and rice milling industries and previous policies such as Export Bonus Schemes were abandoned. [24]The government reversed the policy on public and private investments. The private sector investments went down by 15 %, whereas the public sector investments in manufacturing went up from 5 % to 75%.[25] The agricultural sector saw an increase in output due to the support prices provided to major crops and credit facilities given to farmers. The increase in agricultural productivity was however hit by the floods of 1973, major cotton crop failure during 1974-75, and floods of 1976-77. The international shocks also impacted as the four-fold rise in the prices of petroleum, fertilizer inputs, and oil in 1973 and the global recession of 1974-77 slowed down

[23] Akbar Zaidi, 2015
[24] Akbar Zaidi, 2015
[25] Akbar Zaidi,2015

the economy.[26] This period however saw a massive increase in the provisioning of infrastructure and public services such as health, education, water supply etc. and a large number of labour welfare institutions were established such as the Workers Welfare Fund, Employees Social Security Institutions and Employees Old Age Benefit Institution. The results of NERO were rather mixed. It did push back the free market and strengthened the socialist orientation of the state. This phase was not only short as Bhutto was dislodged by the Military in 1977, the fruits of socialist policies could not be realized fully due to the governance failures and also because, these policies were introduced, when the country was already in distress dealing with the impacts of war, loss of East Pakistan, coupled with natural catastrophe and external shocks.

2.2.2 Industrial Policy 1978-1988:[27]

Pakistan followed a rather stable industrial policy during 1978-1988. This period could be divided in two phases. During 1978-81**,** the government restored the manufacturing units to the private sector, through the denationalisation of agro-based industry and small engineering units. Heavy chemical and cement industries sectors were opened to the private sector with the help of tax rebates and incentives. The export rebates and fixed interest rate on investments in agriculture and industry were however reduced. The investment policies in this phase, prioritised the investments in manufacturing sector that used indigenous raw materials coming from the agriculture sector. [28] During this period, the manufacturing sector experienced modest growth rates of 6 % as compared to 14 % average annual growth from 1949 to 1969 but the export of textiles significantly increased.

During second phase between 1983 and 1988, the process of deregulation and liberalisation began. The policies focused on incentives and institutional reforms for the industry. The sectoral investment planning was introduced to increase the industrial efficiency.[29] The core was export-led industrialisation i.e., to increase manufacturing exports to higher value-added products. [30] Foreign trade was liberalised, tax holidays were given to encourage exports and expansionary polices were opted with the budget deficit standing at 7 % during 1980s.[31] The

[26] Ibid.
[27] Akbar Zaidi,2015
[28] Institute of Development Economics, "The study on Japanese Cooperation in Industrial Policy for Developing Economies: Pakistan," 1994.
[29] Ibid
[30] Ibid.
[31] Ibid.

FDI and foreign assistance showed an increasing trend which helped the government to maintain economic stability and finance its way out of the difficult situations.[32]

2.2.3 Post-Washington Consensus dispersal of Industrial Development Policies

Towards the end of 1988, the country was hit by the financial crisis, as reserves plummeted from $1.2 billion to $0.6 billion, with low investments and savings in the economy, coupled with increasing poverty and structural issues.[33] The Seventh Five Year Plan was formulated for industrial reforms, as the World Bank and IMF interventions in the economy began. The Plan focused on deregulation, increasing investment on private sector, and tariff reforms and the following IMF recommendations for three years agreement from 1988-1991 foretold the mainstreaming of the Washington Consensus in Pakistan's macroeconomic policy hollowing out the Industrial Policy of previous years.[34]

i. Limiting the list of industries closed to FDI;
ii. Deregulate business decisions;
iii. Divesting shares of public sector enterprises to private sector;
iv. Enhancing export incentives;
v. Phase out of tax holidays;
vi. Reduce the list of restricted imported products;
vii. Increase the level of indirect taxation

After the introduction of the Structural Adjustment Reforms, it was only logical to stop issuing an Industrial Policy. With the Ministry of Commerce and the Board of Investment in the lead, the Ministry of Industries, government of Pakistan, occupied itself more with protecting selected sectors from international competition, mainly through tariff protections and technical barriers to trade. This period, which continues to date, could be seen as a period of consolidation of the neo-liberal paradigm. The industrialization objectives are now being realized by a policy framework structure comprised of trade policy, investment policies, infrastructure and sectoral development support [both at federal and provincial levels] and subsidies to chosen sectors and some limited export incentives.

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[32] Akbar Zaidi, 2015; Ashfaque H. Khan and Nasir M. Khilji, "Foreign Direct Investment in Pakistan: Policies and Trends [with Comments]," *The Pakistan Development Review* 36, no. 4 (1997): 959–85, https://www.jstor.org/stable/41260079

[33] Mohammad Zubair Khan, "*Liberalization and Economic Crisis in Pakistan,"* Asian Development Bank, 2000, https://aric.adb.org/pdf/aem/external/financial_market/Pakistan/pak_mac.pdf.

[34] Ibid.

On the ground, however, after a close look at the evolution of the policy environment in Pakistan, one feels that the distinction between the pro-market policies and pro-business policies has blurred over time. Despite the establishment of the Competition Commission of Pakistan and a plethora of regulatory bodies, the regulatory regime has proved ineffective in upholding and promoting the competitiveness of domestic markets on the one hand and has failed to raise the environmental and social externalities an issue of competition policy.

2.2.4 Provincial Industrial Policies

In Pakistan, the development of small-scale industries and the management of industrial estates has always been a provincial responsibility, along with the regulations such as labour laws, environmental regulations, safety regulations etc. The subjects of agriculture, livestock, forestry, fisheries and mines and minerals have always been a provincial subject in terms of development and regulations. The development and exploitation of these natural resources is linked on the one hand with manufacturing, and on the other, with environmental protection and climate change. After 7th National Finance Commission Award in 2010, the provinces in Pakistan started getting around 58 % of the divisible pool resources, which has made available huge development sources to them for infrastructural development and sectoral support. Prior to the 7th NFC, the provinces were getting Rs. 550 Billion and after the award, they started getting Rs. 850 Billion.

Lately, two provinces i.e., Punjab and Khyber Pakhtunkhwa (KP) have designed their own industrial policies for the first time. These primarily focus on investment promotion/mobilization policies and plans. KP's Industrial Policy 2020-30, underscores the presence of abundant natural resources in the province, that could be utilized for economic growth and competitiveness. The policy seeks to establish an investor friendly business platform to incentivise investors.[35] The policy focuses on the promotion of public-private-partnerships, new technologies, and investing in labour intensive and export oriented industries, with a long-term vision of growth and development of the KP-province.[36] Punjab Industrial Policy 2018, focuses on revamping the industrial zones, increasing industrial productivity through improving the skill sets of the labour, fostering investments

[35] Government of KPK, "Industrial Policy 2020-2030," 2020. http://kpboit.gov.pk/wpcontent/uploads/2020/02/KP-Industrial-Policy-2020.pdf
[36] Ibid.

specifically targeting SMEs, improving governance, and developing industrial clusters; with shared infrastructure, technology transfers, skilled workforce, and attracting the globally leading LSMs in these clusters.[37] Both countries have very little to say on challenges posed by climate change.

2.3 Calls for and Need of a New Beginning

With the dispersed industrial policy tools highlighted above, no single ministry acts as a focal point responsible and answerable for the industrial development goals of the country. At the federal level, this is creating serious issues of coordination. As Pakistan does not make a national Industrial Policy formally, the institutional capacity to evaluate the effectiveness of different policy tools has also declined. Similarly, the creation of data on the industrial development is very patchy.

Realizing the need to adopt 'competitive import substitution', [the main thrust of the current Strategic Trade Policy Framework, there are renewed calls to re-introduce industrial policy in Pakistan so that the suite of policy tools needed for the re-industrialization of the country could be developed and effectively deployed. With the services sector not producing enough and/or good jobs, a large number of young people entering the labour market due to high population growth rates in Pakistan and the economic slow-down rendering a large number unemployed, the industrialization is expected to get higher policy attraction. The exigencies of green industrialization also need an anchor of the industrial development policy framework at the national level.

The Pakistan Business Council (PBC), the premier representative of Pakistan's corporate sector, recently published a 'directional paper' titled, *"Contours of a New Industrial Policy"* to highlight ''the key policy thrusts and focus areas, which the government needs to consider as it prepares a new and long overdue industrial policy for Pakistan.'' The new industrial policy in the PBC's views should revolve around a *"Made-in-Pakistan"* theme and be driven by three key success metrics: a) creation of incremental jobs, b) increase in value-added exports, and c) import substitution.[38]

[37] Government of Punjab, "Punjab Industrial Policy 2018," 2018. https://icid.punjab.gov.pk/system/files/Industrial-Policy-Green-Paper_0.pdf
[38] PBC 2018, https://www.pbc.org.pk/research/contours-of-a-new-industrial-policy/

Convinced that Pakistan needs an Industrial Policy, but wary of the old habits excessive tariff protections, some free-market voices advise that the main parameters of the new industrial policy should be open trade, universal reduction of tariffs instead of selective reduction, integration with the global value chains, export orientation, value addition, product development and innovation.[39]

Inclusiveness and greening in both the above perspectives is conspicuous by its absence. In our view, the new industrial policy would be in a better position to green and expand the manufacturing in Pakistan when we are able to imagine a qualitatively different kind of State-Industry engagement and are ready to carve out a coherent industrial development policy framework with a better blend of competitiveness and inclusiveness.

Pakistan's manufacturing sector has witnessed its own, regular boom and bust cycles owing to the historical policies that have shaped the structure and governance of the manufacturing sector. Various factors in Pakistan have resulted in the significant expansion of the informal sector, which primarily consists of small-scale manufacturing. [40] The polices discussed above up until now were primarily formed in consideration of LSM, undermining the productivity and efficiency of SSMs.[41] The textile industry dominates the manufacturing sector, agriculture being its main source of input. However, due to the mono-focus of policy, and complacency of a sector hooked to state subsidies, current manufacturing produces more of low value-added products. The long-term protections given to such local industry/assembling which depend on the imported raw inputs is resulting not only in high import bills and very high local prices, but the products still are not able to compete in international markets. The lack of focus on technology- and efficiency-driven industrial competitiveness has resulted in growth at the cost both of the state resources and consumer welfare. Had the industrial policies adopted a more innovative long-term vision, breaking out of path-dependency, with more efficient overall coordination with other sectors, there could have been a different story to tell and we would not have been mourning the lack of enthusiasm our industry has, in embracing the green transition.

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[39] Ali Salman, "Moving to new Industrial Policy," *The Express Tribune*, August 9, 2021 https://tribune.com.pk/story/2314616/moving-to-new-industrial-policy/2021

[40] Khalid Nadvi & S.M. Naseem,"The Post-Colonial State and Social Transformation in India and Pakistan," *(Oxford University Press, 2002)*

[41] Akabar Zaidi,2015.

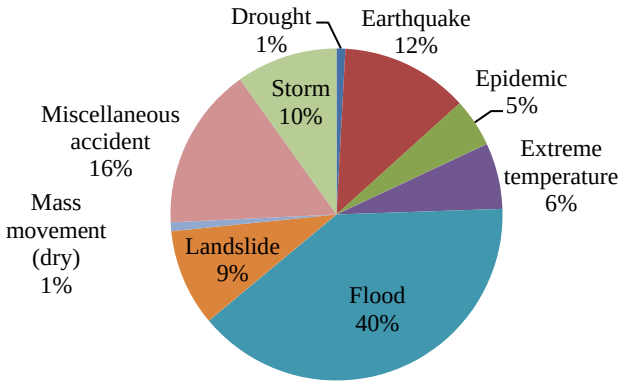
A particular dynamic of the State-Business engagement has become a major feature of the neoliberal development model with Pakistani features. Despite a demonstrated lack of organizational capacity, many uncompetitive sectors of the economy continue to get subsidies as if state-industry engagement was a public-private partnership for the sake of public good, which prevailed from 1948 to 1972 in the country.

Unfortunately, in some cases, the provinces now have also started practising such industrial development policies which distort the competitiveness of markets, either by a race to the bottom [due to selective lax environmental compliances, choosing certain sectors for giving exemptions from labour laws] or a race to support the sectors backed by the provincial business elites as compared to the other provinces [on the basis of excessive subsidies and development dole outs, without linking this support to standards or social, environmental and governance targets], further fragilizing the symbiosis between the industrial development policies and climate policy.

Section 3: Role and impact of Climate Change Policies on the green status of Industry

Pakistan is among the top ten countries most vulnerable to climate change. Figure 3.1 below, shows of the types and the shares of occurrences of natural hazards.

Figure 3.1 Hazard Occurrence in Pakistan 1980-2020



Source: World Bank Climate Change Knowledge Portal [https://climateknowledgeportal.worldbank.org/country/pakistan/vulnerability]

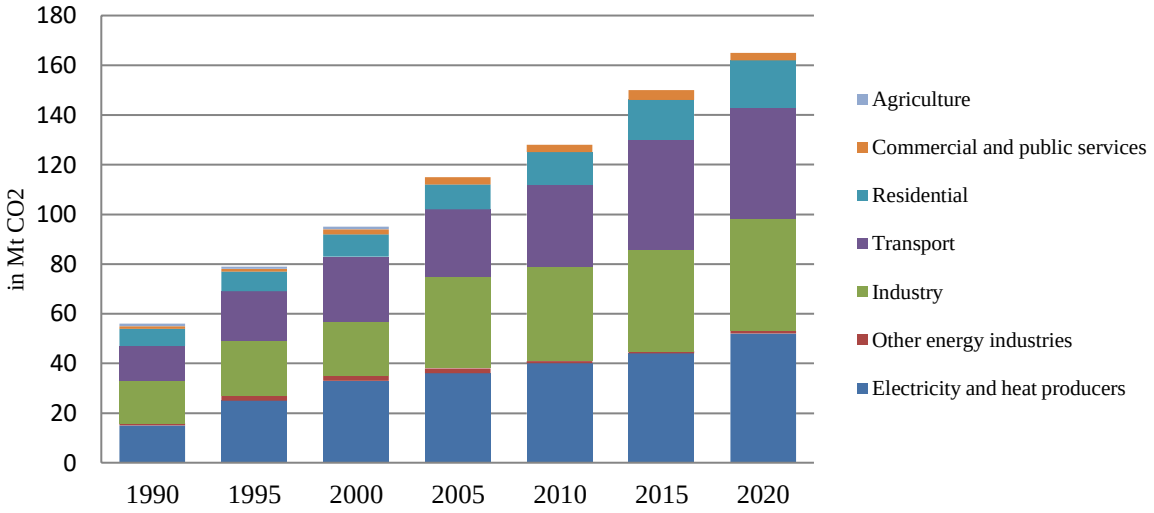
Explaining the economic and human costs of these occurrences would give us the necessary perspective regarding Pakistan's vulnerabilities due to Climate change, despite making only a negligible contribution to the global emissions. According to the World Bank Portal of Climate Change Vulnerabilities, Pakistan is experiencing some of the highest temperatures in the world with some regions experiencing temperatures between 38 C and 50 C. Between 1997–2015, Pakistan experienced about 126 heat waves, around 7 per year. Due to a particularly severe heatwave in 2015, 65,000 people had to be hospitalized and over 1,200 heat-related deaths resulted from this severe heatwave, particularly in Sindh.

Pakistan has been witnessing floods regularly during the monsoon season. UNIRSD has calculated the annual average loss at $ One Billion. The damage of the 2022 floods has been particularly devastating. According to the World Bank press release on October 28, 2022- their damage, loss, and needs assessment, carried out collaboratively with National Disaster management Authority of Pakistan**,** estimates total damages to exceed USD 14.9 billion, and total economic losses to reach about USD 15.2 billion. Estimated needs for rehabilitation and

reconstruction in a resilient way are at least USD 16.3 billion, not including much needed new investments beyond the affected assets, to support Pakistan's adaptation to climate change and overall resilience of the country to future climate shocks**.**, The floods cost 1730 lives, and more than 8 million homeless people, mostly in Sindh. The floods were only the last in the chain of Climate-induced catastrophes which result in economic losses of USD3.8 billion per year, according to the Asian Development Bank (ADB). Pakistan also has been experiencing droughts in different parts of the country, resulting in changing crop patterns, inward migration and food insecurity.

The economic and social costs of these mostly man-made disasters have been huge over the past 13 years, if we accept the inflection point of 2010 floods. These costs dis-proportionally affect the women, children and poor people, particularly in the country side. As the agricultural sector is the worst hit in floods, excessive rains, droughts and heatwaves, these disasters have made the majority of households poorer in the already less developed regions of Pakistan like rural Sindh, South of Punjab, Baluchistan and KPK with millions facing hunger and temporary or permanent displacement. The government has established a National Disaster Management Authority [NDMA]. Pakistan is forced to divert its development funds to disaster management. Both in the case of the major floods of 2014 and 2022, Pakistan did not receive much international aid. Instead, it has to resort to domestic borrowing to cope with the demands of additional expenditure. The irony is that Pakistan is at the receiving end of the climate change vulnerabilities, is spite of the fact that its own GHG emissions historically have been negligible. Pakistan's contribution to GHG is 0.89 % with the following sectoral breakdown.

Figure 3.2 Break-down of Sector Wise CO2 Emissions



Source: IEA Green House Gas Emission [https://www.iea.org/regions/asia-pacific]

Pakistan's vulnerability to Climate Change is confounded due to numerous internal factors such as poor urban planning and water resource management, a lack of infrastructure maintenance, high dependence on agriculture as source of income, revenue and food, governance issues, structural inequalities and multidimensional poverty, limited capacity for disaster risk reduction (DRR), and external shocks such as Covid-19.[42]

Before Pakistan became the signatory to Paris Agreement in 2016, it had adopted a holistic Climate Change Policy in 2012 followed by a Framework for Implementation Climate Policy 2014-30 in 2013. The Ministry of Climate Change, government of Pakistan is the focal ministry for interacting with the international institutions on climate change mitigation and adaptation. The Ministry is using the Nationally Determined Contribution (NDCs) commitments both as a governing framework for international compliances as well as a pathway to implement the recommendations of its Framework of Implementation 2014-30. The following NDCs shared by the Ministry on behalf of the government of Pakistan, with the relevant international bodies are however modest vis a vis the challenges of Climate Change Adaptation and Mitigation.[43]

[42] Government of Pakistan, *"Resilient Recovery, Rehabilitation and Reconstruction Framework; Pakistan (4RF),"* UNDP, 2022. https://www.undp.org/sites/g/files/zskgke326/files/2022-12/Final_4RF with%20Updted%20QR%20Code.pdf

[43] Government of Pakistan, *"Pakistan: Updated Nationally Determined Contributions, 2021,"* 2022. https://unfccc.int/sites/default/files/NDC/2022-06/Pakistan%20Updated%20NDC%202021.pdf

1. Voluntary contribution in reduction of 50% of emissions (35% through conditional and 15% through unconditional measures) by 2030.
2. The Ten Billion Tree Tsunami (TBTT) will reduce the CO_2 emissions by 148.76 MtCo2e by 2030.
3. Transit to 30% of renewable energy sources by 2030.
4. Switch to 30% of electric vehicle by 2030.
5. Increasing the coverage of Protected Areas from 12% to 15% by 2023.
6. Continuation of investments in Nature Based Solutions (NbS).
7. No generation of power through imported coal.
8. Introduce new sectors like blue carbon ecosystem.

In the NDCs, the transition in the greening of economy and industry is expected to happen primarily with the greening of energy and transportation/infrastructure[44] The transport sector has the highest fossil fuel consumption in Pakistan[45], followed by energy. The major focus on energy is therefore logical and optimal.[46] Countries like Japan and Holland, that have done well in transiting towards cleaner modes of production also targeted the transport and energy sectors. UNIDO Pakistan is also primarily working on energy.[47] However, limiting the current NDCs only to two sectors is highly problematic. The government also has not allocated adequate financing for it and is expecting the private sector to attract green investments. The government has also made one of the critical NDC i.e., voluntary reduction in emissions conditional upon getting international financing.

[44] Government of Pakistan, *"Pakistan: Updated Nationally Determined Contributions, 2021,"* 2022. https://unfccc.int/sites/default/files/NDC/2022-06/Pakistan%20Updated%20NDC%202021.pdf

[45] Boqiang Lin and Muhammad Yousaf Raza, "Energy Substitution Effect on Transport Sector of Pakistan: A Trans-Log Production Function Approach," *Journal of Cleaner Production*, 251 (April 2020): 119606, https://doi.org/10.1016/j.jclepro.2019.119606.

[46] Haseeb Yaqoob et al., "Energy Evaluation and Environmental Impact Assessment of Transportation Fuels in Pakistan," *Case Studies in Chemical and Environmental Engineering*, 3 (June 1, 2021): 100081, https://doi.org/10.1016/j.cscee.2021.100081.

[47] UNIDO, *"Green Industry: Policies for supporting Green Industry,"* 2011.

3.1 State of Green Transformation in Traditional Sectors

3.1.1 Energy Sector

In the case of energy, Pakistan has adopted the following roadmap to realize the targets set by 2030:

i. **Better Demand and Supply Management:** the gap between energy demand and supply in Pakistan is large and stood at 3300 Mega Watts (MW). One option is to pursue energy efficiency much more vigourously and transit to a better energy mix. Pakistan has launched numerous energy efficiency measures in different sectors like household, industry, transport etc. It has frequently given itself ambitious targets as well as incentives and has established a number of organizations to support these initiatives at the federal and provincial level. But still, the results have been rather modest due to poor design, execution, governance and enforcement.

ii. **Engaging Private Sector:** Government has engaged the private sector in Punjab and Sindh in a pilot project of Result Based Financing (RBF) which was initiated in 2019. The rationale was to incentivise the private sector to find energy supply solutions, and to encourage private sector investments for off-grid solutions based on the International Finance Corporation's (IFC) global standard products in off-grid communities.[48]

iii. **Improving the Energy Mix**: only 14% of the hydropower potential of Pakistan is exploited. Energy generation through solar photovoltaic (solar PV) is another potential option and requires 0.071% of the country's land, mainly in Balochistan. This indicates that current energy needs can be met through solar power. Wind power generation remains an untapped potential for utilizing energy demand in the coastal areas of Sindh and Balochistan. Although the share of renewable energy has increased to more than 5% in 2022 from 0.25% in 2015, progress is rather slow. During the past two years private and public investment has been announced in renewables which hopefully could enhance the share of renewables in the total energy mix but Pakistan is far from enhancing the share of renewables to 20 % by 2025 [minus the hydro power] and to 30 % by 2030. [SDPI 2022]

[48] Ibid.

iv. **Coal Consumption Trend:** the demand for coal has been rising in the country, and coal consumption for industrial production has increased over five-fold (73%) since 2016, of which 65% is demand from the cement sector. The share of power generation through coal is expected to increase 31% in FY 25 from 24% in FY 21%.[49] The coal found in Thar, Sindh i.e., Lignite is considered financially viable but at present the coal needs are being met by the imported coal. The demand for coal in the power sector is expected to increase because of the higher gas prices. Another factor is that energy demand is sensitive to GDP[50] growth (given the current state of the economy, there is a dire need to meet energy demand), and the only viable short-term solution is to generate energy through coal. However, the enhanced use of largely imported coal comes in direct conflict with our NDC commitment to base no power generation on imported coal.

3.1.2 Green Transport

The transportation sector is regarded as the primary driver of economic growth and development. In Pakistan, it contributes 10% of GDP and generates 6% of jobs. This sector also connects other sectors of the economy through fostering agglomerations, improving national and cross-border trade, and enabling spatial transformation.[51] The current transportation and logistics system is inefficient and costs the economy of Pakistan roughly 4-6% of GDP annually, which is a serious limitation for overall economic performance.[52]

Transport infrastructure plays an important role in reducing emissions and increasing energy efficiency. One aspect is to improve the means of road transport, as suggested by evidence that it has been successful in reducing emissions and fostering green innovations (in short run)[53], such as modernized public transport, electric vehicles, and hybrid vehicles.

It is also a driver of connectivity and accessibility; connecting people to workplaces, healthcare, education, and cities to villages and vice versa, which contributes to overall productivity,

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[49] Ibid.

[50] Ali Ahmed Durrani, Irfan Ahmed Khan, and Muhammad Imran Ahmad, "Analysis of Electric Power Generation Growth in Pakistan: Falling into the Vicious Cycle of Coal," *Eng* 2, no. 3 (September 1, 2021): 296–311, https://doi.org/10.3390/eng2030019.

[51] Muhammad Tayyab Sohail et al., "Pakistan Management of Green Transportation and Environmental Pollution: A Nonlinear ARDL Analysis," *Environmental Science and Pollution Research*, February 6, 2021, https://doi.org/10.1007/s11356-021-12654-x.

[52] Ernesto Sánchez-Triana et al., *Greening Growth in Pakistan through Transport Sector Reforms* (The World Bank, 2013), https://doi.org/10.1596/978-0-8213-9929-3.

[53] Daxin Sun et al., "Can Transportation Infrastructure Pave a Green Way? A City-Level Examination in China," *Journal of Cleaner Production* 226 (July 2019): 669–78, https://doi.org/10.1016/j.jclepro.2019.04.124.

growth, and development.[54] Transport however is also a main contributor to GHG emissions. The transport emissions accounts for 23% of total emissions in Pakistan and it is the second biggest consumer of energy.[55] In Pakistan, the contribution of the Transport Sector to GHG is significant at present and is expected to be the key driver of increase in CO2 emissions on the road to 2030. According to the Greenhouse Gas Mitigation Options for Pakistan: Transport Sector Fact Sheet ''Projected greenhouse gas (GHG) emissions from the transport sector are projected to rise by 128% between 2012 and 2030. Emissions are forecast to grow from approximately 35.4 MtCO2e in 2012 to approximately 80.7 MtCO2e in 2030".[56]

Due to a prolonged neglect of urban public transport in the past, Pakistanis now extensively use motorbikes, which usually use less refined petrol. Around 40% of total petrol used by the vehicles in Pakistan is now used by the motorbikes[57]. Most of the users are workers from lower middle-income class. The greening of motorbike sub-sector is yet to be taken up seriously. The greening initiatives like Electric Vehicle Policy and greening of Highways has made some impact by improving inter-city connectivity, decrease in travel cost and emissions.

Recently, due to a better focus on the sustainable ways to green transport infrastructure, the public transports systems like electric buses, trains and BRT system are gaining some traction.[58] A key factor for the slow emergence of urban public transport systems in Pakistan is that the public transport is a provincial subject, which has resulted in fragmented transport policies that do not align with the urban planning and settings and infrastructure of the land because the government encouraged the private sector to provide transport, leaving a shortage of public transportation. The two-pronged approach i.e., expand public transport system and running the public transport on zero-emission systems is currently available in five major cities in Pakistan with largely federal funding. In parallel, the new highways which increase provincial connectivity are leading in green transformations by greening the highways and the reduction of travel times.

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[54] Leila Mead, "The Road to Sustainable Transport," Policy Brief, *International Institute for Sustainable Development,* 2021. https://www.iisd.org/articles/deep-dive/road-sustainable-transport

[55] Muhammad Tayyab Sohail et al., "Pakistan Management of Green Transportation and Environmental Pollution: A Nonlinear ARDL Analysis," *Environmental Science and Pollution Research*, February 6, 2021, https://doi.org/10.1007/s11356-021-12654-x.

[56] International Institute for Sustainable Development. "Greenhouse Gas Mitigation Options for Pakistan: Transport Sector" https://cdkn.org/sites/default/files/files/fact-sheet-Pakistan-Transport-sector-.pdf],

[57] Syed Akhtar Ali, "New debate on cheaper bike petrol," *The Express Tribune*, December 12, 2022 https://tribune.com.pk/story/2390662/new-debate-on-cheaper-bike-petrol

[58] Leila Mead, "The Road to Sustainable Transport," *International Institute for Sustainable Development*, (May 24, 2021) https://www.iisd.org/articles/deep-dive/road-sustainable-transport

Greening of Transport depends heavily on the greening of energy sources. The government has adopted to shift 30% of the transport vehicles to electric but there is little progress on the ground, which is a serious cause of concern. [Updated government of Pakistan NDCs 2021]

3.2 State of Green Transformation in Manufacturing:

Pakistan has been making rather slow progress to change the paradigm of its climate-insensitive manufacturing. It is expected to become 16th largest economy of the world by 2050. [59]The increase in population density has led to an expansion of unsustainable industries leading to environmental costs.[60] Climate Policy of 2021 outlines the necessary adaptation steps and highlights the various sectors' vulnerabilities to climate change. These encompass the use of policy to deal with problems in a number of domains, including water, agriculture, forestry, coastal regions, biodiversity, and other ecosystems that are fragile. Despite Pakistan's negligible share in the world's greenhouse gas (GHG) emissions, Pakistan has been made clear that it is a responsible member of the international community, and it is prioritizing climate change mitigation in the energy, transportation, forestry, and agricultural sectors. Additionally, the policy has included suitable measures for disaster preparedness, capacity building, institutional strengthening, technology transfer, and international cooperation as significant elements.

However, the one basic aspect that the policy fails to address is to focus on the greening of the industrial sector through green outputs and value addition. As an unfortunate logical corollary to this lack of focus, it is extremely hard at present to scientifically determine the green status of Pakistan's manufacturing as Pakistan currently lacks green data on industry. Most of the data available is about the high pollution levels, rather than having a more critical lens to it.[61]

UNIDO has developed the following indicators in its Green Industrial Performance index (GIP) [62]:

I. Green Manufacturing Value Added (MVA) per capita

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[59] Dilawar Hussain, "Pakistan could become 16th largest economy by 2050: PwC," *Dawn*, February 9, 2017 https://www.dawn.com/news/1313636

[60] Ernesto Sánchez-Triana et al., *"Revitalizing Industrial Growth in Pakistan Trade, Infrastructure, and Environmental Performance Private Sector Development,"* (World Bank, 2014) https://openknowledge.worldbank.org/bitstream/handle/10986/19022/897010PUB0BOX3014648002830Jun222014.pdf?seque.

[61] Marcelo Acerbi, "For a Clean and Green Pakistan," Blogs. World Bank, 2019, https://blogs.worldbank.org/endpovertyinsouthasia/clean-and-green-pakistan.

[62] Jaime Moll de Alba and Valentin Todorov, *"Measuring and Benchmarking the Green Industrial Performance of Countries and Economies: The GIP Index,"* (United Nations Industrial Development Organization, 2022)

II. Green Manufactured Exports per capita
III. Share of Green MVA in MVA
IV. Share of green manufactured exports in total manufactured exports (%)
V. Share of green manufacturing employment in total employment
VI. Co2 emissions from manufacturing per unit of MVA

In the case of Pakistan, the data except partially for the sixth indicator is not available. The Co2 emissions are available only for the manufacturing sector, and not for value-added. Each of the above indicators explores the extent to which an industry is moving towards a green future. Unavailability of data on green production. is a very big constraint for evaluating the progress in terms of the strategies put in place by the government for the greening of the industrial sector.

Following the Climate Change Policy of 2012, the Ministry of Climate Change put in place, in 2013, a Framework for Implementation of Climate Change Policy 2014-2030. The Framework identifies the following Strategies on greening the industry in Pakistan:

I. Incorporating economic incentives to promote emission reduction by upgrading industrial processes and technologies.
II. Preparing voluntary Corporate Social Responsibility (CSR) guidelines and encouraging the corporate sector to create a CSR-fund to cover carbon emission reductions efforts in industrial sector.
III. Promoting the integrated "Cleaner Production" strategy in the Industrial sector by making more efficient use of inputs such as energy, water, raw material, etc.
IV. Promoting the use of energy efficient motors in the industrial sector.
V. Encouraging the industrial sector to have periodical "Energy Efficiency Audit".
VI. Developing capacity to monitor and estimate emissions locally for each industry.
VII. Ensuring that technology transfer is accelerated for the industries like cement manufacturing to control emissions without hampering the production process.

In the case of the National Climate Change Policy 2021, which is an update of the 2012 Policy, Industry is not listed among the sectors of interest under adaptation. The Industry was listed under the ''Mitigation'' with the following measures:

a. Incorporate economic incentives to promote emission- reduction by upgrading industrial processes and technologies;
b. Prepare voluntary "Corporate Social Responsibility" (CSR) guidelines and encourage

the corporate sector to create a CSR fund to cover carbon emission reduction efforts in industrial sector;

c. Detailed aerosol emission impact assessment studies must be made a requirement prior to the installation of any new small and large industry that may be considered a potential source of pollution;

d. Promote integration of the "Cleaner Production" strategy in the Industrial sector by making more efficient use of inputs such as energy, water and raw materials;

e. Promote the use of energy efficient motors in the industrial sector;

f. Encourage the industrial sector to have periodic "Energy Efficiency Audits";

g. Develop capacity to monitor and estimate emissions locally for each industry;

h. Ensure that technology transfer is accelerated for industries like cement manufacturing, to control emissions without hampering the production process;

i. Explore and introduce incentives for industries to adopt low- emission technologies e.g. dual- functional materials for Carbon capture, utilization, and storage (CCUS);

j. Legislate opportunities for industry to facilitate transition to circular economy model and boost the market demand for recycled products.

If we compare the two sets of measures above, the 2021 measures are basically a rehash of earlier policy with some additional aspirations like, '' Ensure that technology transfer is accelerated for industries like cement manufacturing, to control emissions without hampering the production process. Alost all the measures continue being aspirations after all these years and we have not even produced reliable data on these measures to evaluate the progress, which could have proved helpful in developing a coherent policy framework and governance structure for the green industrialization.

Also, it is hard to align the above measures with the UNIDO indicators in order to explain the scope of green industrialization in the country. A cursory look at the policies dealing with the industrial development in the country tells us that the industrial policy responses have not been properly attuned towards the climate change neither for LSM nor for the SMEs, particularly at the federal level.

The Climate Change mitigation efforts in Pakistan mainly include the projects like Ten Billion Tree Tsunami (TBTT) Project, Enhancing Protected Areas, and conditional and unconditional emission reduction. These efforts will reduce the emissions somewhat, but the sector wise emissions will not be much affected as the energy is not expected to fully transit to renewable

energy, which is the major source of input in sectors. In other words, though these efforts are helpful, the manufacturing sector needs a bigger, dedicated policy focus. As highlighted above, there are the backward and forward climate change links to each sector in the economy and value addition to GDP. The national vision still lacks climate change at core of the policy to each sector (polices are not integrated at any level as sectors have stand-alone policies).

The delayed and patchy policy response is also linked to the state of institutional infrastructure of the country and the financial capacity. The Government, as explained in Section I, has limited capacity for it, while many of the manufacturing sub-sectors are struggling with premature deindustrialisation. The useful technologies needed to address the issues of competitiveness and climate change under a unified framework of the modernization of manufacturing in Pakistan, are either expensive, or do not gel with the existing infrastructure. The economy lacks the innovative capabilities and the flow of technology from abroad is also very slow. Instead of a major economy wide green transformation, what we have is that some industries are taking small steps towards green industrialisation by complying with international standards such as ISO 14001 for exports and some activity is taking place in the CSR context. A big push towards the green industrialization is long overdue.

Section 4: Binding Constraints and Key Challenges for Pakistan in Pursuing Transformative Green Industrialization

On the basis of an extensive survey of literature, analysis of reports and documents from the government and development partners and background discussions with experts and representatives of the government, we have identified the key binding constraints, which are hampering/can hamper the pursuit of Green Industrialization in Pakistan.

4.1 Poor Policy Conceptualization of Green Industrialization

In our view, the biggest constraint in the way of Green Industrialization in Pakistan is the state of poor conceptual grasp of ‘’Green Industrialization’’ as a policy and a process, at the confluence of environmental policy, climate change policy and industrial policy. The proliferation of the ‘pathways’ of greening have also added to the complexity. In Pakistan, the provinces have lately been pushing for the marriage between the traditional environmental protection policies and their industrial policies. The federal government bats for the climate policy but is unable to leverage it with the provincial environmental protection laws and regulations and Industrial Policy. In the absence of a national industrial policy, the symbiosis between industrial policy and climate policy is hypothetically absent at the federal level. The second version of National Sustainable Development Strategy [NSDS] got prepared by the government supported by UNEP and officially adopted in 2012, carries the sub-title Pakistan’s pathway to sustainable and resilient future, but talks only of water, energy and agricultural sectors in terms of economic challenges. An earlier version of NSDS prepared in 2009 but not accepted by the Ministry had a 100 pages long section on production and trade. The Climate Change Policy of 2012 introduced by the same ministry had identified industry as a sector of interest under ‘’Mitigation’’. Climate policy can only become an overarching policy in the economic growth framework of green industrialization, [of the current and new industries separately], if green industrialization finds a proper place in the yet to be announced National Climate Change Adaptation Plan.

4.2 Absence of Peer Pressure on the Industry to Green

In Pakistan, a virtual industrial policy manifests itself in the process of arbitrage and adjustment to the provincial industrial policies and the demands of different sectors. The pathways to green industrialization involve the reduction of externalities in production such as inefficient energy use, resource wastages, emissions, effluents, etc. Externalities are better managed when there

is peer pressure from the competitors or recipients of externalities. Punjab's Environmental Protection Agency Regulations 2000 empower the Agency to monitor the pollution spread by different manufacturing sectors and put penalties on them. It also requires the industrial units to self-report on the environmental pollution data. These regulations have been there now for more than 20 years and there is little on ground to show/see. The clarity and ownership of the policy goals, presence of organizational capacity to monitor, generate quality data, enforce the necessary regulations, resist to the business pressures, all are better managed when the relevant agencies as well as the industry feels the pressure to perform.

4.3 Inadequate Policy Responses from the Economic Ministries to the Exigencies of Green Industrialization

As the Ministry of Industries and Production, government of Pakistan, has not yet brought out any Green Industrialization Policy Framework document, the functional linkages between different policy arenas and institutions are rather weak. The officers at MOIP do not much know about the possible impacts of Climate Change Mitigation and Adaptation challenges on the national and international viability and competitiveness of Pakistan's key industrial sectors. The officers at the Ministry of Climate Change, on the other hand, do not know much about the threats from EU's Green Deal for Pakistan's exports to EU. The Import Policy Order, Ministry of Commerce, government of Pakistan, has an annexure of regulations for the international trade of environmentally sensitive goods. There is some awareness in the Ministry of Commerce to guard Pakistan's offensive or defensive interests in the case of carbon intensive products due to its involvement with EU on GSP Plus Scheme, which provides almost duty-free access to Pakistan's exports in EU in lieu of Pakistan promise to implement the UN Human Rights Conventions, including the Environmental Standards.

One of the reasons for the poor policy response to climate imperatives is the lack of data on green status of different manufacturing sectors.

4.4 Problems with Data

In Pakistan, the carbon footprint is calculated on the basis of annual emissions of a sector.[63]The GHG emissions from the manufacturing sector at present stand are 5% of the total emissions as the energy; agriculture and transport take the major share 46 %, 41 %, and 23%

[63] Kaleem Anwar Munir & Muhammad Ijaz, "Greenhouse Gas Emission Inventory of Pakistan for the Year 2011-2012," GCISC-RR-19, *Global Change Impact Studies Centre (GCISC*), Islamabad, 2016. http://www.gcisc.org.pk/GHGINVENTORY2011-2012_FINAL_GCISCRR19.pdf

respectively.[64] However, it is projected that the industry's emissions will rise by 230% by 2030 if no mitigation takes place.[65] The seemingly low contribution of manufacturing origin emissions however needs to be seen in perspective. When we talk about the greening industrialization, we are imagining a set of processes aiming to decouple economic growth from negative environmental externalities by maximising the application of clean energy, sustainable inputs and green-production technologies. We need data on all the three. Also, it is difficult to neatly separate the textiles and slaughtering sectors from agriculture, energy and transport as the three make a part of their inputs. When, it comes to fertiliser, it is an input to agriculture. Energy is also the major source of construction sector. The recent data available for GHG emissions shows that the Energy contributes 49 % and 25-35 % of the total emissions in case of Cement and Fertiliser.[66] In other words, manufacturing is at the heart of green industrialization. Due to a superficial attraction of sectoral emission contributions of GHG and mitigation, the manufacturing is given much less attention in greening of the economy, [except some activity in terms of clean cotton production and energy efficiency of the textile and clothing value chain], through a better blend of mitigation and adaptation efforts. Knowing the green status of goods and services produced and consumed in a country is the key to understand the green transformation of the economy and society.

4.5 Lack of Green Innovations

Green innovation is defined as a tool for producing products at a lower cost.[67] In a private sector context, even when a firm is aware that they could have a competitive advantage through the green innovation, the hurdles like insufficient human resources, lack of commitment by the top management of the firm, and a lack of green logistics can dissuade them from investing in green innovation [68] The governmental organizations in Pakistan have not been able help the relevant firms much due to poor R&D culture. Green Innovations flourish more in those

[64] Hamid Waleed, "Energy, agri sectors responsible for most of GHG emissions: report,". *Business Recorder*. Accessed November 23, 2023 https://www.brecorder.com/news/40202331/energy-agri-sectors-responsible-for-most-of-ghg-emissions-report

[65] Department for International Development (DFID), "Greenhouse Gas Mitigation Options for Pakistan: Industry Sector," 2020. https://www.ccrd.edu.pk/files/Industry_LCS%20Factsheet.pdf

[66] Dawar Butt, Lauri Myllyvirta and Sunil Dahiya, "CO2 Emissions from Pakistan's Energy sector," *Centre for Research on Energy and Clean Air*, Helsinki (2021) https://energyandcleanair.org/wp/wp content/uploads/2021/07/CO2-Emissions-from-Pakistans-Energy-sector_30_07_2021.pdf

[67] K. Govindan et al., "Investigation of the Influential Strength of Factors on Adoption of Green Supply Chain Management Practices: An Indian Mining Scenario," *Resources, Conservation and Recycling* 107 (February 2016): 185–94, https://doi.org/10.1016/j.resconrec.2015.05.022.

[68] Sajid Ullah et al., "Mapping Interactions among Green Innovations Barriers in Manufacturing Industry Using Hybrid Methodology: Insights from a Developing Country." *International Journal of Environmental Research and Public Health* 18, no. 15 (2021)

countries where the environmental standards and quality are seriously enforced and adaptation attracts the firm to innovate with or without the support of the government. The lack of awareness of environmental compliance and climate goals also contributes to it, limiting the initiatives toward green innovation in the private sector.[69] In our initial assessment, most of the public sector organizations responsible for R&D in green technologies, in most of the cases, are unaware of the prospects of green technologies needed to decarbonise the economy.

4.6 Lack of Awareness on the Green Practices

There is growing literature on the pathways and practices which help in the greening of industry, benefitting from the successful experiences and experiments in different countries/sectors. Some need better awareness for adoption. Some need a transition incentive combining the advantages of compliance and competitiveness. In some cases it is a weakness or absence of law, regulation and enforceability through financial incentives such as soft loans or tax rebates to promote green practices, which is the problem such as in the Construction Sector.[70] A Climate sensitive policy culture has still to grow much more for an easy acceptability, at the level of firms and sector, of the green practices like lean manufacturing, circular economy, industrial symbiosis etc. supported by the scientific community.

4.7 Inadequate Availability of Green Finance

The green finance framework, needed to promote green innovations in the economy is weak in Pakistan.[71] Such as green investments are usually costly and long term. For example, an average renewable and green project takes 6 to 10 years to develop, finance and construct.[72] In this regard, the uncertainty and credibility of the policies of the government and State Bank of Pakistan could have negative impacts on the green finance.[73] In Pakistan, the local green banking system is also not well equipped and resourced for financing and developing the green products for varied range of customers.[74] Though, the State Bank of Pakistan has recently

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[69] Muhammad D. Abdulrahman, Angappa Gunasekaran, and Nachiappan Subramanian, "Critical Barriers in Implementing Reverse Logistics in the Chinese Manufacturing Sectors," *International Journal of Production Economics* 147 (January 2014): 460–71, https://doi.org/10.1016/j.ijpe.2012.08.003.
[70] Sana Azeem, et al,. "Examining barriers and measures to promote the adoption of green building practices in Pakistan." *Smart and Sustainable Built Environment* (2017).
[71] Ibid.
[72] Muhammad Umar Ayaz & Zahid Majeed, "Green Financing to Support Energy Transition: Options and Challenges for Pakistan," *SDPI*, 2022. Policy Brief 82.
https://sdpi.org/assets/lib/uploads/Green%20Financing%20to%20Support%20Energy%20Transition%20Options%20and%20Challenges%20for%20Pakistan%20pb-82.pdf
[73] Ibid.
[74] Ibid.

introduced the Green Banking Guidelines (GBGs), its impact is yet to be seen. Similarly, the capital markets are also not prepared to finance green projects and boost the green organisations i.e., creating favourable and innovative climate friendly financial instruments.[75] The lack of data on green products and green production instruments, which could pave the way for the growth of green financing, is also major constraint. At present, when we mostly talk about green financing in Pakistan. With better data available, it would be easier to develop a more ambitious road map for green financing. As some bilateral donors are open to debt swaps for financing green development projects, the lack of coordination among different ministries is hampering the realization of such opportunities.[76].

4.8 Preponderance of Informal Economy

The informal economy makes up the major share of Pakistani economy, estimated to be between 35 % to 56 %.[77] Locally it is characterized as the cottage industry. The informal industrial economy mainly comprises of small scale and home-based manufacturing, construction, personal services and transport sectors.[78] The informal economy poses all the traditional challenges to the industry in Pakistan such as the lack of inclusiveness and hard to regulate as compared to formal sectors for the environmental standards. The informal industry partially follows the boom [expansionary policies] and stagnates during the bust [contractionary policies] but, it is quite hard to know as to what was happening in the sector. It is highly likely that the informal economy keeps the country afloat in terms of employment and other economic activities. According to the Labour Force Survey 2021, the share of employment of the informal economy is 72 %.[79] However, it is pretty hard to measure the carbon footprint of the informal economy and green it. Still, if we focus more on understanding the greening challenges of non-traditional manufacturing sectors, other than textiles, the government could finetune its climate policy for informal economy/SMEs.

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[75] Ibid.
[76] Ibid.
[77] Lalarukh Ejaz, "Informal Sector," *Dawn*, March 4, 2021 https://www.dawn.com/news/1610606
[78] ILO, “Informal Economy in Pakistan (ILO in Pakistan),” www.ilo.org, January 19, 2023, https://www.ilo.org/islamabad/areasofwork/informal-economy/lang--en/index.htm#:~:text=The%20key%20sector%20of%20employment.
[79] Government of Pakistan, Ministry of Planning, Development & Special Initiatives, Pakistan Bureau of Statistics, *"Pakistan Labour Force Survey 2020-2021,"* PBS, 2022, https://www.pbs.gov.pk/sites/default/files/labour_force/publications/lfs2020_21/LFS_2020-21_Report.pdf

4.9 Relatively Costlier Green Practices for Local Manufacturing

In Pakistan, there is a general impression that the greening of manufacturing is more costly, with relatively smaller short-term gains. The number of green vendors in Pakistan to meet the potential demand to kick-start green manufacturing in the domestic markets is rather small.[80] The green technologies and raw materials, such as renewable materials are more often than not imported. Importing is already costly in Pakistan due to exchange rate fluctuations. The government is putting additional taxes and duties on imports to increase the revenue as well as to restrict imports, which makes the final products very expensive as compared to the non-green products.[81] With high inflation, the demand for the low-priced products that are produced with scant care to the environmental standards goes up. A good example is fashion. There are some textile manufacturers in Pakistan working with green vendors dealing with organic cotton to produce sustainable clothing, but these clothes are way more expensive than conventional clothing, making them out of reach for most of the consumers. The consumers end up buying the non-green clothing, creating disincentive for the green manufacturers.

[80] S. Abdul Rehman Khan et al., "Impact of Green Practices on Pakistani Manufacturing Firm Performance: A Path Analysis Using Structural Equation Modeling," *Computational Intelligence and Sustainable Systems*, December 15, 2018, 87–97, https://doi.org/10.1007/978-3-030-02674-5_6.
[81] Ibid.

Conclusion and the Way Forward

The TORs of the Background Paper had been designed to produce critical knowledge on the current state of symbiosis between the climate policy and industrial policy as the quality of this symbiosis is going to be the key factor in advancing the green transformation in the country through green industrialization. As a good understanding of the current macroeconomic situation was considered a necessary prerequisite before discussing contemporary and future dynamics of a transformative change that we seek to debate and promote, in terms of green industrialization, in this Background Paper, we have analysed the Pakistan economy which is in the midst of a severe macroeconomic turbulence. From this precipice, whether the economic system of Pakistan heads towards a big [destructive] disruption or a major [constructive] reform of the system towards a more prosperous and equitable Pakistan, it would depend on multiple transformations, involving consideration of deeper political economy dynamics, efficient use of natural and human resources, potency of transformative policies and enhanced organizational capacities to implement difficult reforms.

Frequently occurring man-made and natural disasters in Pakistan have made its economic, societal and environmental eco-systems very fragile. One reason for the state of affairs has been a disregard of environmental and social justice for the sake of such a growth model which is based less on efficiency and competitiveness and more on state largesse and debt. In such a system, some businesses have developed a habit of monopolizing the benefits and socializing the losses to the society directly through inflation or indirectly through subsidies. The pattern of the state-business engagement in Pakistan has been such that the state has not been able to ensure that the same businesses who benefit from the state policies in creating wealth reduce the societal and environmental externalities in their respective sectors. The State in Pakistan needs to reassert itself to rebalance the business interest with inclusiveness is central to such deeper structural reform, from which Pakistan now can escape only at its own peril.

Green Industrialization is a metaphor for the transformed state after a successful transformation of industry where greening is a key driver of competitiveness and inclusiveness. In Section two and three, we have studied the evolution and performance of the industrial policy and climate policy as the vectors of development and sustainability respectively and their internal weaknesses. We realize that the greening impact of the past environmental protection and climate policies and plans on industry is directly proportional to the success of the relevant

stakeholders in bringing the industrial development policies and climate adaptation and climate mitigation in a symbiotic relation.

Our general macro and sectoral analyses show that the pace of green industrialization in Pakistan has been very slow. We have dilated upon the key binding constraints on green industrialization in Pakistan in Section 4. We realise that the knowledge and evidence support [to make the transformative approaches work at the macro, sectoral and cross-cutting,] needs not only to be fully cognizant of the binding constraints but also have a capacitated imagination to come up with the solutions to strengthen the symbiosis between the climate policy and industrial policy.

As a **way forward**, it is proposed that, while designing different components of the UNCTAD Pakistan Project, we take into account the following key insights generated through the analytical work undertaken to write the Background Paper, as inputs for designing the UNCTAD Pakistan Project with a view to directly and indirectly strengthen the interdependence and mutual leveraging between the climate policy and industrial policy as a vector of green industrialization in Pakistan:

- There is less than satisfactory understanding among most of the relevant actors of the historical [constraining] context in which the industrial development, environmental protection and climate policies are developed, implemented and evaluated.
- The internalization of climate policy imperatives and exigencies by the industry remains poor as they continue taking it as an externally imposed compliance like the core labour standards or environmental standards.
- The quality of data to base climate change adaptation plan for the manufacturing sector is very poor as compared to the data needed for the mitigation planning.
- The internal relationship between environment policy and climate policy is very problematic in Pakistan. The challenges of environmental degradation are embedded in the local contexts and the relevant laws, jurisprudence and standards in this regard are fairly well developed. The main problem with these laws is their inadequate implementation due to poor design, enforcement capacity and collusion. In case of Climate Policy, the production of data produced by the Centers such as the one established with the help of donors like Global Change Impacts Studies Centre, Islamabad [2002] has helped Pakistan adopt Nationally Determined Contributions but

the Climate Policy in Pakistan is not fully grown yet as we wait for the announcement of National Climate Change Adaptation Plan in 2023.

- The quality of knowledge and evidence-based awareness and ownership of green industrialization not only paves the way for the identification of robust deliberate actions in different sectors to minimise the bad impacts of the current and future climate changes, it can also facilitate the voluntary and externally imposed enforcement of regulations.
- The sectoral greening work in textile, transport and agriculture is at a rather early stage in Pakistan. It is too small with very limited coverage. In all these cases, the dominant approach adopted is a small-time piece-meal approach, which produces modest results as compared to a transformative approach] rooted in environmental protection such as cleaner production or energy efficiency in transport and is usually driven by NDCs or SDGs. Due to limited climate change adaptation planning for industry on both sides of the symbiotic policy framework, the capacity to anticipate climate change impacts in future on the industry and propose policy responses to it is limited. As a result, the green manufacturing policies in case of new manufacturing are almost absent and remain unsupported. Conceptually, we should produce policy relevant knowledge to support somewhat separate policy responses for greening the existing manufacturing and for the new green industries.
- The governance of environmental issues is very different from the climate change. The latter requires significant restructuring of the economy as the decarbonisation is a process that affects all economic sectors and ultimately will lead to a large-scale industrial transformation. Whereas the environmental protection is more about rolling old practices back like less habitat destruction, less pollution, less pesticides, less plastics etc. which could be realized with the help of better regulations, standards and taxes. But, in case of the Climate Change, merely the regulations are not enough as the industrial transformation is predicated upon a large-scale, coherent action by many ministries of the federal and provincial levels and private businesses and the society.
- Green Industrialization is not yet mainstreamed even among the traditionally important development partners in Pakistan. A case in point is the latest World Bank's Pakistan Country Climate and Development Report [WBG 2021], which does not include green industrialization as a pathway, despite the fact that World Bank data states that

manufacturing contribute 24 % of CO2 emissions. The Report identifies the following 3 Pathways:

- Agriculture-Food System Transformation
- Building Resilient and Liveable Cities
- Transition to sustainable energy and transport

All this report has in terms of greening of manufacturing, is the future carbon tax on the use of fossil fuel, which means energy becoming more expensive in the short term. There are surely many other pathways to greener manufacturing but are seldom discussed in such Reports. UNCTAD Project would surely help other development partners to add even more value in their development work towards green transformation of Pakistan.

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