PAKISTAN STATE OF FUTURE INDEX

ANTICIPATING 2027

Improving the well-being of the people of Pakistan

Prepared by
Foresight Lab

In collaboration with
Pakistan's academia, think tanks, experts and professionals

Along with technical assistance provided by
The Millennium Project

This effort is dedicated to the people of Pakistan

To having a cause, to initiating a conversation, to furthering an interaction, to giving meaning - this has been Foresight Lab's journey; and yet this is only the beginning. We are indebted to our families, friends, and to all those extraordinary beings who, in the course of over one year believed, felt and thought that this is a journey worth being a part of. While we bear this responsibility, we pray that this support continues on; encouraging us to move closer to 'Improving the well-being of the people of Pakistan'.

Putting people at the heart of all decisions.

Puruesh Chaudhary & Dr. Shahid Mahmud

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THE HISTORY OF PAKISTAN FUTURES

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Historically, events hold meaning because they represent structures and trends coming together and generating specific instances of decision-making by individual actors, which is often what narrative history excels at relating. One should not overstate the importance of such events because the ability or inability of a society to respond depends upon structural strengths and weakness and other trends. The deep structures that operate on historical actors are working against Pakistan and, in terms of geography, environment, mentality, and demography, there is little ground for optimism. This said, in anticipating the next 10 years, understanding the past as three interconnected layers of historical causation can be helpful:

- Historians often begin their analysis of a region or country by examining geography (including location), natural environment and ecological resilience, demography (including distribution), and mentality. These factors typically exist beyond the means of a society to control or manipulate within a single human lifespan, and attempts to push a state or empire beyond these hard limits can often trigger collapse or decline. As these factors assert themselves regardless of our perceptions, they can be understood as objective factors, and they are also sometimes thought of as ultimate causes.

- While geography, environment, demography and mentality explain a great deal about how societies develop, the interaction between people and their world produces inter-subjective realities, which include values, ideology, and economic, scientific, educational, social, military, and political tendencies. These tendencies can play out over decades, generations, or even centuries, and often reflect problems and opportunities that arise from the operation of objective factors.

- The layer of causes most familiar to the lay reader is that of events. These can be military, political, religious, cultural, or economic, and capture attention at a particular moment. The responses generated by these events will depend upon the range of options enabled by the first two set of factors, and will lead to the application of the power of a society to attempt to resolve matters in its favor. This effort, however, may produce conflicts within that society and/or bring it into conflict with other societies with competing agendas.

Examining how these three sets of factors might affect Pakistan at present and into the near future:

- Pakistan's geographic location and environmental susceptibility to the effects of climate change and water scarcity are serious causes for concern. The territories that presently comprise the country had perhaps 30 million inhabitants in 1947, and today they have more than 200 million. Much of this expansion has been linear, leading to reduction in the sizes of agricultural holdings and horizontal expansion of cities, and extractive, with reliance on unsustainable practices, like tapping underground water sources. Pakistan has a forecasted population of 243 million by 2027, putting even more stress on water reserves. Pakistan's geographic vulnerability to the spillover of conflict in Afghanistan, as well as its enmity with India, are also a major cause of concern. Relying on China Pakistan Economic Corridor to deliver a trump card is a risky gamble though one that Pakistan's elites have decided to take.

- In terms of epistemology and worldview, Pakistani mentality has, since independence from British rule, reverted to a pre-Enlightenment framework. There is very little acceptance of the inherent validity of scientific knowledge, while the notion that ethics are a function of psycho-social conditions rather than religious or ideological beliefs is one that has very little traction in Pakistan. While many Pakistanis wish to emulate the lifestyles of the industrialized world, they do not seek to internalize the rationalism, humanism, and positivism, which form the core of the scientific revolution that made modern civilization possible. This is also accompanied by a traditional patriarchal approach towards women, leaving half the population in a condition of exceptionally great disadvantage by virtue of gender. The general apathy towards learning and knowledge is reflected in part in Pakistan's poor overall performance in education, women's empowerment, and investment in scientific innovation. There is little indication that any of this will improve drastically over the next 10 years.

- Pakistan's youthful population will need jobs and skillsets. The trouble is that the low levels of education and productivity would require a large number of unskilled or semiskilled jobs in low-end manufacturing and services. The public sector,

which presently has 3.3 million civilian employees and 800,000 military employees, can absorb some of the increase, but with defense, debt servicing, and subsidies, consuming practically all revenues, the scope for such interventions is limited barring a dramatic improvement in tax collection. The employment elasticity of Pakistan's economic growth will be critical for increased FDI flows (from CPEC or other sources) but may not actually translate into more sustainable jobs for Pakistanis. Pakistan is therefore likely to experience economic growth in the range of 4-7% over the next decade, but that growth will not translate into development of the productive capacity and competitiveness of the economy and society. It is also not clear what impact automation in the wealthier economies of the Middle East, which furnishes Pakistan with remittances, will have over the next ten years.

Coming to the second tier of factors, the record is somewhat less stark. A core ingredient of Pakistan's resilience as well as its dysfunction has been a powerful military capable of acting as a political and administrative reserve, on occasion pushing other actors to take steps it regards as necessary for the preservation and prosperity of the country. The precipitous decline in the level of terrorist violence over the past three years is a case in point, while a number of vital policy choices, such as heavy investment in higher education, liberalization of the media, and the financial globalization of Pakistan's economy, were taken by the last military regime.

Generally, these policies have accelerated the rise and growth of a significant middleclass in Pakistan with aspirations comparable to the middleclass elsewhere in the world. These aspirations include a desire for effective governance, a strong distaste for the compromise and "corruption" inherent in democratic politics, a demand for better quality of technical education, and a desire to imitate the lifestyles and consumption patterns of wealthier countries. As this class grows and becomes more politically assertive, Pakistan may well see a shift in its politics from traditional patronage to early modern forms of populism, which can easily swing towards fascism given the conservative leanings of much of society. The urbanization of Pakistan is also likely to provide greater strength to the middleclass, while a redrawing of the electoral map in view of the 2017-18 census is almost inevitable in time for elections in the 2020s.

From this shift, several political outcomes might materialize by 2027.

The first is that Pakistan's democratic process continues and adjusts to the rise of the middleclass, shifting the priorities of governments towards what this ascendant constituency deems fit. The second is that Pakistan's democratic leaders attempt to stymie the political effects of this trend leading to the already fragile loyalty of the middleclass towards democratic processes snapping. The third is that while making political accommodations, the governance system continues to slide relative to the demands being placed on it, which might generate a critical mass in favor of violent right-wing populist upheaval.

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EXECUTIVE SUMMARY

The world is undergoing rapid transformations in every field of human endeavor. Spectacular advances in genomics, artificial intelligence, regenerative medicine, new materials, energy and other fields are transforming our lives in ways that are often disruptive and serendipitous. Nanotechnology is impacting engineering, industry, medicine and agriculture. Truth has become stranger than fiction. In this scenario, it has become vitally important for us to introduce Future Studies in our schools, colleges and universities as well as have a Future Index that assesses our preparedness for these disruptive changes and provides insights regarding future strategies. In Pakistan, a Foresight Lab is important development.

Prof. Dr. Atta-ur-Rahman, UNESCO Science Laureate

There is a general consensus that advancement of technology will inherently challenge the conduct of governance in future, however, there is lack of understanding as to how the process of policy formation and its implementation will achieve the current endeavor with the advent of the technological paradigm shift. The lack of acknowledgement for technology as a core element in drafting the policy framework remains a paradox in Pakistan.

The idea that policymaking and its subsequently developed solutions and models, should be data-driven foresight research is becoming ever more ingrained in the mind of policymakers around the world. The main motivation behind this is to help people make well-informed choices and decisions about policies, programs and future trends by using existing data.

Big data analytics and artificial intelligence is driving the world towards a Fourth Industrial Revolution. Pakistan needs to foresee the challenges and opportunities that will arise. The first step in navigating through uncertainties or unintended consequences is to develop tools and skills required for this wave.

Foresight Lab is platform that aspires to facilitate policymakers, academia, business community and information governing bodies to anticipate change and its implications in navigating the turbulent future that arises due to unrelenting and unforeseen events, identify trends and alternate pathways towards a desirable future. The Lab will systematically explore, create, and test both possible, preferred, plausible and desirable futures in order to improve decisions and processes.

Just as the person on top of the mast on old sailing ships used to point out the rocks and safe channels to the captain below for the smooth running of the ship through uncharted waters, futurists with foresight systems can point out problems and opportunities to leaders and the public around the world. State of Future Index is one of those methods. It helps enhance long-term strategic thinking by asking if the future is better in ten years, what that means specifically and what variables will show that. And then integrate ten-year forecasts of each variable into one measure – a ten-year index – a Pakistan State of the Future Index (PK-SOFI).

Pakistan State of the Future Index (PK-SOFI) is a first step towards developing a foresight

for evidenced based policymaking by analyzing the historical data of selected variables for the previous twenty years, projection of variables for next ten years augmented with judgments of the best and worst plausible values for each variable. It is constructed with key variables that are individually forecasted and in sum total manner compute into a single potential trend of the future. The following course of action would then enable a more consolidated analysis that can complement established methods of analysis and shape short to medium term policy responses in a way that is consistent with addressing major long-term challenges. The results and recommendations of Foresight Lab research will be published and disseminated through networks and partners in the field of future-oriented thinking among different stakeholders in order to foster the reflection on these key future-oriented issues to address the future challenges on a national and global level.

The real and the most powerful tool of emancipation today would be 'knowing' - 'knowing' that our evolution is not yet complete but is ongoing, 'knowing' that we, like all other living species, have the capability to evolve and 'knowing' that we have the most powerful tool that Nature has yet produced for evolution, i.e. the human intellect and its corresponding sensitivity process. Today's Leadership, which is a necessary component of making changes in the social dimension, needs two indispensable ingredients for becoming truly effective: a) understanding of the history of mind and b) understanding of the nature and mechanics of the mind.

Raza Kazim, Sanjan Nagar Institute of Philosophy and Arts

PAKISTAN STATE OF FUTURE INDEX

STATE OF FUTURE INDEX

The State of the Future Index (SOFI) is a forecasted index, based on selected variables, to show whether the future outlook is improving or not. As such, the index is used in policy analysis to assess whether the contemplated future will move towards betterment. SOFI, which is composed of global and country level variables, indicates whether human conditions in a given country or region have improved or not and whether they seem likely to improve or not. The index is comprehensive in its coverage because it captures important dimensions of sustainable human development such as economics, environment, politics etc.

The global State of Future Index (SOFI) has been prepared and published by The Millennium Project since 2000. It has shown that the general future was improving (though not at similar trends as in previous decades) until 2008 when the global financial crisis hindered the progress as was anticipated. At country levels, some countries in Latin America and North America have been preparing national SOFIs relying on unique set of variables in each country (generally referred to as National Focus Indices). South Korea, South Africa, Kuwait, Azerbaijan and Turkey are also among the countries with national SOFIs.

This report presents the first SOFI for Pakistan i.e. Pakistan State of Future Index (PK-SOFI), 2017. As a national index, PK-SOFI has considered thirty variables that are further classified using STEEP (Social, Technological, Economic, Environmental and Political) approach and thus cover a wide variety of indicators that will help Pakistan make some relative sense of the future.

In the PK-SOFI, selected variables were forecasted and combined into a single measure. The outlook of the future seems to be changing, PK-SOFI makes it clear how, and the index makes it possible to identify the factors responsible for the change. PK-SOFI can be used for policy purposes: plans and strategic direction which could be evaluated and a comparison drawn on the basis of their impact on the National State of the Future Index.

PAKISTAN STATE OF FUTURE INDEX

"The Pakistan State of Future Index (PK-SOFI) should be a very useful tool for evaluating where we are heading. The policymakers can use it to make realistic decisions to achieve the desired results and adjust the course of action to keep the country on the preferred path." - **Senator Mohsin Khan Leghari, Senate of Pakistan**

Pakistan State of Future Index, like global State of Future Index, follows an established methodology as defined by The Millennium Project and its sixty nodes across the world. Pakistan State of Future Index (PK-SOFI) is the first attempt in the country and a first step towards establishing a trend towards data-driven foresight oriented policymaking. Policymakers are just one of the stakeholders that can use this tool. Foreign investors can identify the trends established by PK-SOFI to make decisions about their future investment, a transparent mechanism for computation of PK-SOFI will develop trust among different stakeholders while at the same time develop a consensus for driving Pakistan towards a better future.

VARIABLES OF PAKISTAN STATE OF FUTURE INDEX

Pakistan State of Future Index (PK-SOFI) was computed with thirty variables. These variables were selected using sentiment analysis along with expert judgment. The list of variables agreed upon by the collaborative network is relevant to the country's overall development.

S. No.	Pakistan State of Future Index (PK-SOFI) Variables
1A	Population, total in millions
1	CO2 emissions (kt)
2	Alternative and nuclear energy (% of total energy use)
3	Food production index
4	Forest area (% of land area)
5	Freedom level (Freedom from corruption)
6	GDP per capita (constant 2010 US $)
7	GDP per unit of energy use (constant 2011 PPP $ per kg of oil eq.)
8	Intentional homicides (per 100,000 people)
9	Mortality rate, infant (per 1,000 live births)
10	Individuals using the Internet (% of population)
11	CPIA transparency, accountability, and corruption (1=low to 6=high)
12	Life expectancy at birth, total (years)
13	Youth literacy rate, population 15-24 years, both sexes (%)
14	Refugee population by country or territory of origin
14A	Internally displaced persons (number, high estimate)
15	People killed or injured in terrorist attacks (www.picss.net)
16	People Voting in Elections % of national population of voting age)
17	Physicians (per 10,000 people)
18	Population growth (annual %)
19	Improved water source (% of population with access)
20	Poverty headcount ratio at $1.90 a day (2011 PPP) (% of pop)
21	Malaria – Confirmed with Microscopy (WHO)
22	Research and development expenditure (% of GDP)
23	Tertiary Education (Universities)
24	Proportion of seats held by women in national parliaments (%)
25	Total debt service (% of GNI)
26	Unemployment, total (% of total labor force) (national estimate)
27	Imports (Millions US $)
28	Exports (Millions US $)
29	Federal Taxes (Total in millions)
30	Inflation, consumer prices (annual %)

Note: Variables 14A and 16 were dropped due to insufficient data and are not included in the final computation.

METHODOLOGY

Steps involved in computation of Pakistan State of Future Index (PK-SOFI) are:

- Identification and selection of variables for Pakistan State of Future Index (PK-SOFI)
- Collection of Historical Data
- Forecasting of Variables for next ten years
- Each variable was non-dimensionalized
- Assigning Weights and Best/Worst Values of Variable
- Establishing Baseline PK-SOFI
- Conducting Realtime Delphi (RTD) Study
- Construction of PK-SOFI using the Realtime Delphi (RTD) Study Results

IDENTIFICATION AND SELECTION OF VARIABLES FOR PAKISTAN STATE OF FUTURE INDEX (PK-SOFI)

Foresight Lab's collaborative network, which comprises of academia, think tanks, policymakers, security experts and industry professionals, decided on which variables should be selected for computing Pakistan State of Future Index (PK-SOFI). Experts from The Millennium Project and collaborative network of universities and think tanks finalized the selection of the variables to be computed, which became the foundation of this National Focus SOFI. The academia and the experts self-assigned variables for identification of past and future trends and defined how these variables can create opportunities or challenges for Pakistan in the future. Two variables were dropped from the final computation because of inadequate historical data.

In future computation also, the collaborative network can decide on the variables to be included or excluded from the study.

COLLECTION OF HISTORICAL DATA

Annual national historical data for selected variables were collected. The data extends 20 years back in time, where possible even further back. For the years in which data was missing, the missing points were approximated by interpolation using an equation obtained by fitting the available historical data points.

S. No.	Variable	Details	Source(s)
1A	Population, total in millions	Total population is based on the de facto defini-tion of population, which counts all residents regardless of legal status or citizenship. The values shown are midyear estimates.	Pardee Center for International Futures (Ifs), World Bank and Pakistan Bureau of Statistics
1	CO2 emissions (kt)	Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid and gas fuels and gas flaring.	Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States.
2	Alternative and nuclear energy (% of total energy use)	Clean energy is non-carbohydrate energy that does not produce carbon dioxide when generated. It includes hydropower and nuclear, geothermal, and solar power, among others.	International Energy Agency Statistics. These are subject to their terms and conditions.
3	Food production index	Food production index covers food crops that are considered edible and that contain nutrients. Coffee and tea are excluded because, although edi-ble, they have no nutritive value.	Food and Agriculture Organization, electronic files and website.
4	Forest area (% of land area)	Forest area is land under natural or planted stands of trees of at least 5 meters in situ, whether productive or not, and excludes tree stands in agricultural production systems (for example, in fruit plantations and agroforestry systems) and trees in urban parks and gardens.	Food and Agriculture Organization, electronic files and website.
5	Freedom level (Freedom from corruption)	The score for the Freedom of corruption index is derived primarily from Transparency International's Corruption Perceptions Index. For countries that are not covered in the CPI the freedom from corruption score is determined by using information from internationally recognized and reliable sources. Higher index values denote lower level of corruption.	The Freedom from Corruption index for Pakistan from the Heritage Foundation uses mostly the data from Transparency International, an NGO that tracks corruption perceptions around the world.

6	GDP per capita (constant 2010 US $)	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars.	World Bank national accounts data, and OECD National Accounts data files.
7	GDP per unit of energy use (constant 2011 PPP $ per kg of oil eq.)	GDP per unit of energy use is the PPP GDP per kilogram of oil equivalent of energy use. PPP GDP is gross domestic product converted to 2011 constant international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as a U.S. dollar has in the United States.	International Energy Agency World/Country Statistics subject to its Terms and Conditions.
8	Intentional homicides (per 100,000 people)	Intentional homicides are estimates of unlawful homicides purposely inflicted as a result of domestic disputes, interpersonal violence, violent conflicts over land resources, inter gang violence over turf or control, and predatory violence and killing by armed groups.	UN Office on Drugs and Crime's International Homicide Statistics database.
9	Mortality rate, infant (per 1,000 live births)	Infant mortality rate is the number of infants dying before reaching one year of age, per 1,000 live births in a given year.	Estimates Developed by the UN Interagency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division). Projected data are from the United Nations Population Division's World Population Prospects; and may in some cases not be consistent with data before the current year.
10	Individuals using the Internet (% of population)	Internet users are individuals who have used the Internet (from any location) in the last 3 months. The Internet can be used via a computer, mobile phone, personal digital assistant, games machine, digital TV etc.	International Telecommunication Union, World Telecommunication/ ICT Development Report and database.

11	CPIA transparency, accountability, and corruption (1=low to 6=high)	Transparency, accountability, and corruption in the public sector assess the extent to which the executive can be held accountable for its use of funds and for the results of its actions by the elec-torate and by the legislature and judiciary.	World Bank Group, Country Policy and Institutional As-sessment (CPIA) database.
12	Life expectancy at birth, total (years)	Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.	United Nations Population Divi-sion. World Population Pro-spects, Census reports and oth-er statistical publications from national statistical offices, Eurostat: Demographic Statis-tics, United Nations Statistical Division. Population and Vital Statistics Report (various years), U.S. Census Bureau: International Database, and Secretariat of the Pacific Community: Statistics and Demography Programme.
13	Youth literacy rate, population 15-24 years, both sexes (%)	Number of people age 15 to 24 years who can both read and write with understanding a short simple statement on their everyday life, divided by the population in that age group. Generally, 'literacy' also encompasses 'numeracy', the abil-ity to make simple arithmetic calculations. Divide the number of people aged 15 to 24 years who are literate by the total population in the same age group and multiply the result by 100.	UNESCO Institute for Statistics

14	Refugee population by country or territory of origin	Refugees are people who are recognized as refu-gees under the 1951 Convention Relating to the Status of Refugees or its 1967 Protocol, the 1969 Organization of African Unity Convention Gov-erning the Specific Aspects of Refugee Problems in Africa, people recognized as refugees in ac-cordance with the UNHCR statute, people granted refugee-like humanitarian status, and people pro-vided temporary protection. Asylum seekers–people who have applied for asylum or refugee status and who have not yet received a decision or who are registered as asylum seekers–are ex-cluded. Palestinian refugees are people (and their descendants) whose residence was Palestine be-tween June 1946 and May 1948 and who lost their homes and means of livelihood as a result of the 1948 Arab-Israeli conflict. Country of origin generally refers to the nationality or country of citizenship of a claimant.	United Nations High Commis-sioner for Refugees (UNHCR), Statistical Yearbook and data files, complemented by statistics on Palestinian refugees un-der the mandate of the UNRWA as published on its website.
14A	Internally displaced persons (number, high estimate)	Internally displaced persons are people or groups of people who have been forced or obliged to flee or to leave their homes or places of habitual resi-dence, in particular as a result of armed conflict, or to avoid the effects of armed conflict, situa-tions of generalized violence, violations of human rights, or natural or human-made disasters and who have not crossed an international border. *Due to Insufficient Data this Variable was dropped. It was recommended during one of the interaction with a Foresight Lab's member policy network the critical nature of computing the var-iable for subsequent PK-SOFI.*	Internal Displacement Monitor-ing Centre.

15	People killed or injured in terrorist attacks		Pakistan Institute for Conflict and Security Studies
16	People Voting in Elections % of national population of voting age)	Insufficient data	
17	Physicians (per 10,000 people)	Physicians include generalist and specialist medical practitioners.	World Health Organization's Global Health Workforce Statistics, OECD, supplemented by country data.
18	Population growth (annual %)	Annual population growth rate for year t is the exponential rate of growth of midyear population from year t-1 to t, expressed as a percentage. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.	Derived from total population. Population source: United Nations Population Division. World Population Prospects, United Nations Statistical Division. Population and Vital Statistics Report (various years), Census reports.
19	Improved water source (% of population with access)	Access to an improved water source refers to the percentage of the population using an improved drinking water source. The improved drinking water source includes piped water on premises (piped household water connection located inside the user's dwelling, plot or yard), and other improved drinking water sources (public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, and rainwater collection).	WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation

20	Poverty headcount ratio at $1.90 a day (2011 PPP) (% of pop)	Poverty headcount ratio at $1.90 a day is the percentage of the population living on less than $1.90 a day at 2011 international prices. As a result of revisions in PPP exchange rates, poverty rates for individual countries cannot be compared with poverty rates reported in earlier editions. The Head count ratio (HCR) is the proportion of a population that exists, or lives, below the poverty line.	World Bank, Development Research Group. Data is based on primary household survey data obtained from government statistical agencies and World Bank country departments.
21	Malaria – Confirmed with Microscopy (WHO)	The number of patients identified to have malarial parasite. The microscopy test is used to identify the parasite, this test involve staining and direct visualization of the parasite under the microscope.	World Health Organization's Global Health Workforce Statistics, OECD, supplemented by country data.
22	Research and development expenditure (% of GDP)	Expenditures for research and development are current and capital expenditures (both public and private) on creative work undertaken systematically to increase knowledge, including knowledge of humanity, culture, and society, and the use of knowledge for new applications. R&D covers basic research, applied research, and experimental development.	United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics.
23	Tertiary Education (Universities)	Number of Students enrolled in universities.	Economic Survey of Pakistan
24	Proportion of seats held by women in national parliaments (%)	Women in parliaments are the percentage of parliamentary seats in a single or lower chamber held by women.	Inter-Parliamentary Union (IPU)
25	Total debt service (% of GNI)	Total debt service is the sum of principal repayments and interest actually paid in currency, goods, or services on long-term debt, interest paid on short-term debt, and repayments (repurchases and charges) to the IMF.	World Bank, International Debt Statistics.

26	Unemployment, total (% of total labor force) (national estimate)	Unemployment refers to the share of the labor force that is without work but available for and seeking employment. Definitions of labor force and unemployment differ by country. Percentage of total workforce who are unemployed and are looking for a paid job.	International Labour Organization, Key Indicators of the Labour Market database.
27	Imports (Millions US $)	Goods and services brought into a country.	Economic Survey of Pakistan
28	Exports (Millions US $)	Good and services sent out of a country.	Economic Survey of Pakistan
29	Federal Taxes (Total in millions)	Total Federal Tax includes both direct and indirect taxes levied by the government.	Federal Board of Revenue – Pakistan
30	Inflation, consumer prices (annual %)	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services.	State Bank of Pakistan

EXTRAPOLATING THE DATA

The historical data presented in this study ranges from the year 1997 to the year 2017. The values of each variable from 2017 onwards to 2027 were forecasted using various statistical techniques and each variable was given a curve fit that gives it a reasonable co-efficient of determination (R2), reducing the margin of errors between real data and the value produced by the chosen function. The curve fits for each variable are mentioned in the Annex.

NON-DIMENSIONALISING THE VARIABLES

Since each of the thirty variables have a different measure, for example, population is measured in units but R&D expenditure is in percentage of GDP, it was therefore necessary to non-dimensionalize each variable so that they can be computed in comparison. This was done by picking a maximum and minimum value from each data set using the following formula below:

$$\text{Non-dimensional value} = (\text{actual value of the variable} - \text{MIN})/(\text{MAX} - \text{MIN})$$

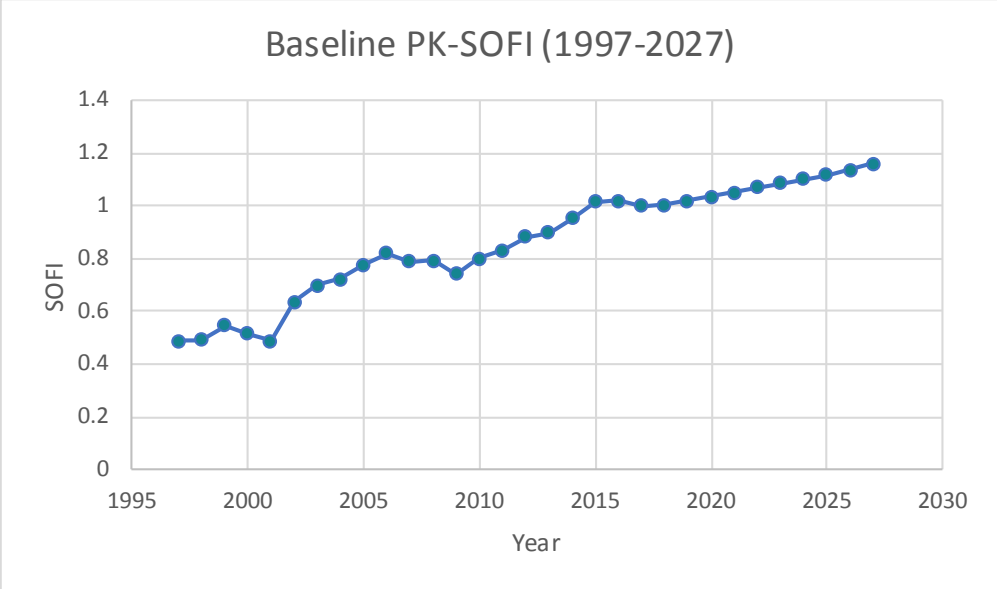
ASSIGNING WEIGHTS AND BEST/WORST VALUES OF VARIABLES

The Lab's collaborative network assigned weightage to each of the variable i.e. providing the level of priority up to 10 being most essential. More than 20 experts participated in the National Focus SOFI. They were provided with a toolkit and an explanation of how PK-SOFI computation utilizes their opinion in the form of weightage. The weightage and best/worst values provided by the experts representing the median responses are mentioned below:

S. No.	Variables	Weights	Best Value	Worst Value
1A	Population, total in millions	8	125	185
1	CO2 emissions (kt)	6	160,000	250,000
2	Alternative and nuclear energy (% of total energy use)	5	6.0	4.5
3	Food production index	8	150	100
4	Forest area (% of land area)	5	2.1	1.2
5	Freedom level (Freedom from corruption)	8	30	20
6	GDP per capita (constant 2010 US $)	9	200	100
7	GDP per unit of energy use (constant 2011 PPP $ per kg of oil eq.)	7	20	10
8	Intentional homicides (per 100,000 people)	6	2	10
9	Mortality rate, infant (per 1,000 live births)	7	40	70
10	Individuals using the Internet (% of population)	6	85	40
11	CPIA transparency, accountability, and corruption (1=low to 6=high)	8	6	2
12	Life expectancy at birth, total (years)	7	72	65
13	Youth literacy rate, population 15-24 years, both sexes (%)	9	95	75
14	Refugee population by country or territory of origin	6	1,500,000	2,000,000
14A	Internally displaced persons (number, high estimate)	Insufficient data		
15	People killed or injured in terrorist attacks (www.picss.net)	7	9	5000
16	People Voting in Elections % of national population of voting age)	Insufficient data		
17	Physicians (per 10,000 people)	5	11	7
18	Population growth (annual %)	8	1.5	1.8
19	Improved water source (% of population with access)	9	98	90
20	Poverty headcount ratio at $1.90 a day (2011 PPP) (% of pop)	9	10	20
21	Malaria – Confirmed with Microscopy (WHO)	7	10,000	500,000
22	Research and development expenditure (% of GDP)	7	0.55	0.33
23	Tertiary Education (Universities)	7	1,650,000	1,500,000
24	Proportion of seats held by women in national parliaments (%)	6	25	20
25	Total debt service (% of GNI)	6	1.5	3
26	Unemployment, total (% of total labor force) (national estimate)	9	5	10
27	Imports (Millions US $)	5	47,000	45,000
28	Exports (Millions US $)	6	40,000	20,000
29	Federal Taxes (Total in millions)	7	5,000,000	2,500,000
30	Inflation, consumer prices (annual %)	9	5	10

BASELINE PK-SOFI

The weightage and best/worst values assigned by the Lab's network of experts were used to construct the Baseline PK-SOFI. The non-dimensional values of each variable per year were multiplied with weightage assigned to that variable. The sum of each variable across the time period of 30 years (1997-2027) was calculated and divided by the sum value of the base year (2017). The values and shape of baseline PK-SOFI with value of unity for base year 2017 is as follows:



Year	SOFI (Baseline)
1997	0.488
1998	0.491
1999	0.548
2000	0.516
2001	0.487
2002	0.636
2003	0.700
2004	0.722
2005	0.776
2006	0.820
2007	0.789
2008	0.792
2009	0.742
2010	0.799
2011	0.830
2012	0.881
2013	0.898
2014	0.953
2015	1.017
2016	1.020
2017	1.000
2018	1.002
2019	1.018
2020	1.035
2021	1.052
2022	1.069
2023	1.084
2024	1.100
2025	1.117
2026	1.136
2027	1.158

REALTIME DELPHI (RTD) STUDY

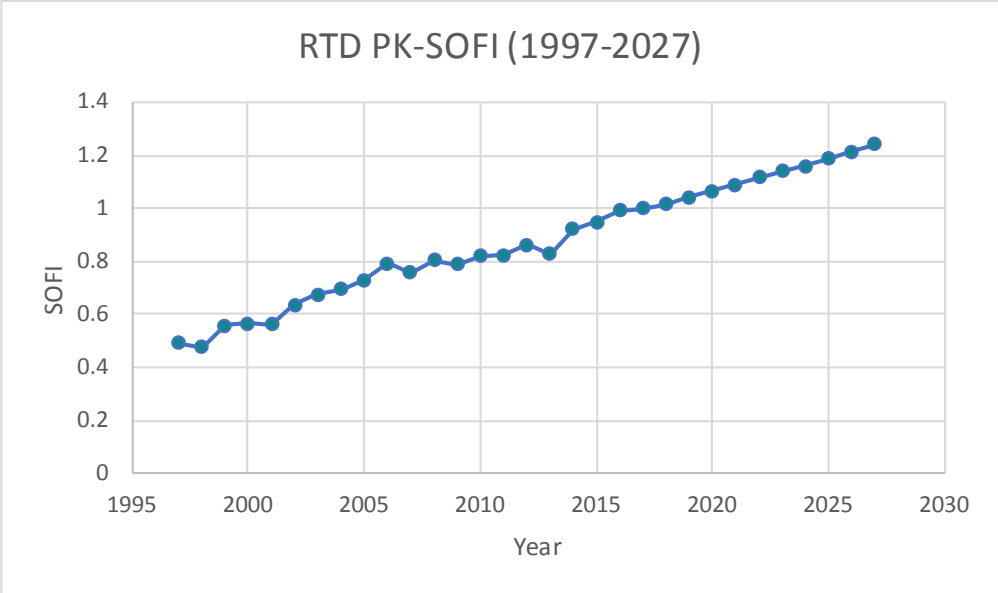
"It is becoming increasingly difficult to keep up with all the technological advances. In such times it is imperative for the policymakers to develop a better sense of the undercurrents that drive decisions. The Realtime Delphi (RTD) is an effective tool for the policymakers to make informed and timely decisions. Our policies must cater for our expectations of the future." - **Farzana Yaqoob, Asia Institute of Public Policy**

Realtime Delphi (RTD) is a structured, consensus based, online and anonymous communication process by which participants judge the gathered and forecasted data, thus assigning weightage, best/worst values to each variable. The RTD method was succinctly explained beforehand to participants. The details of the technique and participants are mentioned in the annex. The questions were like what level of priority (weightage), and best/worst values should be assigned to each variable. The results of the Realtime Delphi (RTD) Study are tabulated as follows.

S. No.	Variables	Weights	Best Value	Worst Value
1A	Population, total in millions	8.50	193.44	293.01
1	CO2 emissions (kt)	9.00	83,850.48	167,841.68
2	Alternative and nuclear energy (% of total energy use)	9.00	7.80	3.51
3	Food production index	9.00	60.69	35.46
4	Forest area (% of land area)	9.00	4.39	1.85
5	Freedom level (Freedom from corruption)	9.00	46.85	17.82
6	GDP per capita (constant 2010 US $)	9.00	324.57	131.31
7	GDP per unit of energy use (constant 2011 PPP $ per kg of oil eq.)	9.00	23.49	9.41
8	Intentional homicides (per 100,000 people)	8.50	7.61	21.15
9	Mortality rate, infant (per 1,000 live births)	9.00	49.83	131.86
10	Individuals using the Internet (% of population)	9.00	60.81	25.48
11	CPIA transparency, accountability, and corruption (1=low to 6=high)	9.00	1.17	4.99
12	Life expectancy at birth, total (years)	8.00	69.87	42.25
13	Youth literacy rate, population 15-24 years, both sexes (%)	9.00	52.96	49.45
14	Refugee population by country or territory of origin	9.00	518,053.15	1,559,277.32
14A	Internally displaced persons (number, high estimate)	Insufficient data		
15	People killed or injured in terrorist attacks (www.picss.net)	9.00	5,219.04	14,503.95
16	People Voting in Elections % of national population of voting age)	Insufficient data		
17	Physicians (per 10,000 people)	8.00	15.13	6.01
18	Population growth (annual %)	9.00	0.96	3.61
19	Improved water source (% of population with access)	9.00	47.76	42.50
20	Poverty headcount ratio at $1.90 a day (2011 PPP) (% of pop)	8.00	14.59	41.84
21	Malaria – Confirmed with Microscopy (WHO)	8.00	236,791.14	638,106.86
22	Research and development expenditure (% of GDP)	8.00	0.98	0.28
23	Tertiary Education (Universities)	8.00	2,462,667.63	1,058,336.50
24	Proportion of seats held by women in national parliaments (%)	8.50	31.79	13.36
25	Total debt service (% of GNI)	9.00	3.82	9.44
26	Unemployment, total (% of total labor force) (national estimate)	8.00	4.14	12.40
27	Imports (Millions US $)	8.00	22,557.70	72,904.42
28	Exports (Millions US $)	8.00	6,812,853.70	2,654,891.17
29	Federal Taxes (Total in millions)	8.00	4,673,339.63	4,269,777.81
30	Inflation, consumer prices (annual %)	8.00	9.25	12.06

CONSTRUCTION OF PAKISTAN STATE OF FUTURE INDEX (PK-SOFI) USING THE REALTIME DELPHI(RTD) STUDY RESULTS

The process used to compute Baseline PK-SOFI was repeated but this time with values of weights and best/worst values collected from the RTD Study. The results of this iteration are tabulated below:



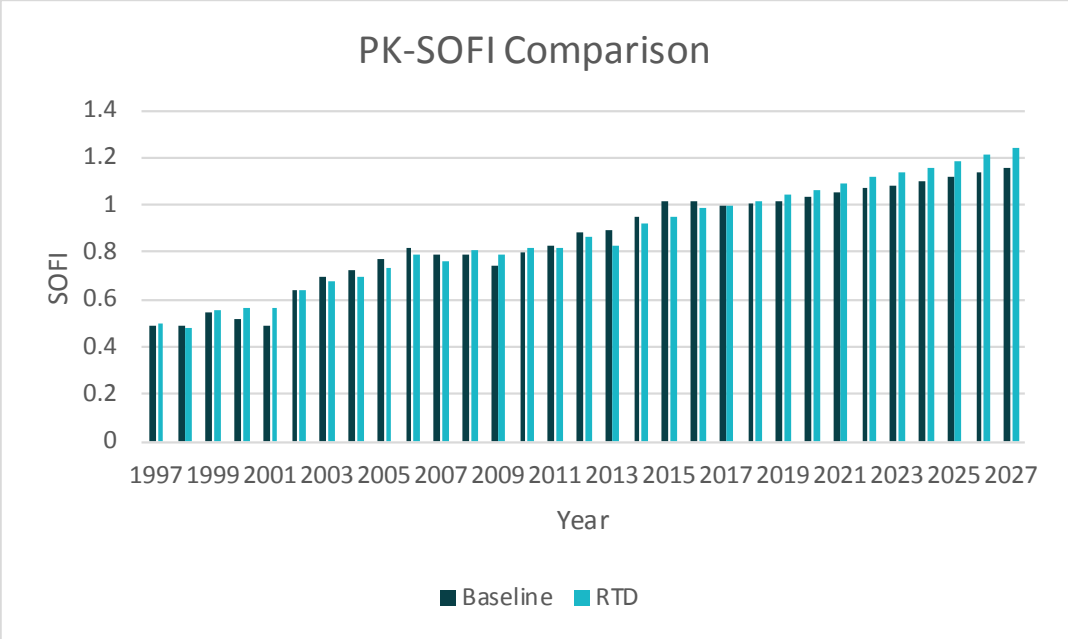
Year	SOFI (RTD)
1997	0.494
1998	0.476
1999	0.559
2000	0.566
2001	0.563
2002	0.636
2003	0.677
2004	0.697
2005	0.730
2006	0.793
2007	0.759
2008	0.806
2009	0.788
2010	0.819
2011	0.823
2012	0.863
2013	0.826
2014	0.920
2015	0.948
2016	0.991
2017	1.000
2018	1.017
2019	1.041
2020	1.065
2021	1.090
2022	1.115
2023	1.139
2024	1.161
2025	1.186
2026	1.213
2027	1.240

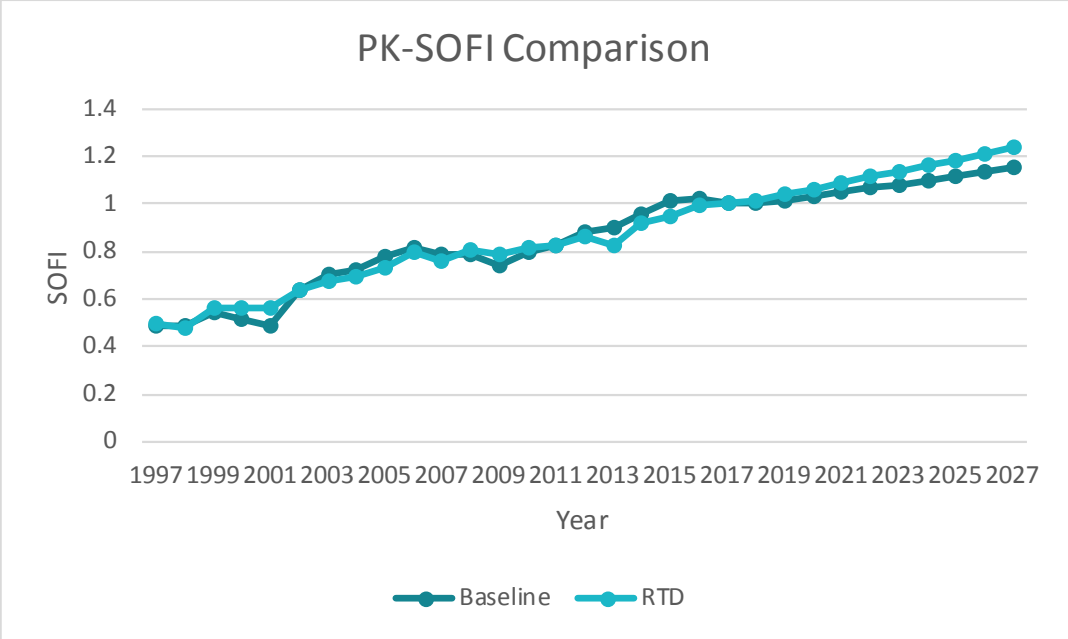
COMPARISON OF TWO ITERATIONS OF PAKISTAN STATE OF FUTURE INDEX (PK-SOFI)

"For governments to make people-centric policies, they must know in realtime what is happening (curate the data), use that data to make effective plans and after deployment follow up and assess if the decision made has created significant impact." - **Dr. Saad Ahmed Khan, Dadabhoy Institute of Higher Education (DiHE)**

The comparative results of two iterations show us a diversification of opinion and at the same time a consensus on how Pakistan's future may look like. One of the reflections can be that people from different walks of life, who participated in Realtime Delphi (RTD) Study, have a comparatively positive outlook of the future. Participants of the Realtime Delphi (RTD) Study also gave overwhelmingly high or very high priority/weightage to almost all the variables selected for Pakistan State of Future Index (PK-SOFI). The weightages assigned in two iterations were separately applied on past data and compared but final result used only the results of first iteration (baseline) till year 2017 and consequently two indices were computed till year 2027, thus giving Pakistan two plausible states of the future. The results of two iterations are as follows:

Year	SOFI (Baseline)	SOFI (RTD)
1997	0.488	0.494
1998	0.491	0.476
1999	0.548	0.559
2000	0.516	0.566
2001	0.487	0.563
2002	0.636	0.636
2003	0.700	0.677
2004	0.722	0.697
2005	0.776	0.730
2006	0.820	0.793
2007	0.789	0.759
2008	0.792	0.806
2009	0.742	0.788
2010	0.799	0.819
2011	0.830	0.823
2012	0.881	0.863
2013	0.898	0.826
2014	0.953	0.920
2015	1.017	0.948
2016	1.020	0.991
2017	1.000	1.000
2018	1.002	1.017
2019	1.018	1.041
2020	1.035	1.065
2021	1.052	1.090
2022	1.069	1.115
2023	1.084	1.139
2024	1.100	1.161
2025	1.117	1.186
2026	1.136	1.213
2027	1.158	1.240





"Our education system, our research and development needs to become agile and robust which solves Pakistani challenges. Technology has had a great deal of impact on the behaviours of the younger generation, we must embrace the newer ways of learning as a collective." - **Shazia Ismat Zaidi, Bloomfield Hall System**

RESEARCH & DEVELOPMENT INDUSTRY IN PAKISTAN

Dr. Aadil Nakhoda
Institute of Business Administration

There is a misconception that natural resources and low-value added commodities, such as textile products, constitute world trade. On the contrary, world trade is increasingly dominated by the increasing prominence of capital and consumer goods that are dependent on knowledge-intensive production processes. There is an increasing role of research and development activities on global manufacturing output. One of the biggest advantages of the movement in capital goods and industrial inputs across borders is the transfer of technology that is likely to be embedded in the imported product. Unfortunately, Pakistan has been stuck in the vicious cycle of producing relatively low-value added goods.

The import composition of Pakistan has changed tremendously in the recent years in favor of capital goods as a result of the advent of CPEC. Several projects related to the development and the upgrading of the infrastructure fall under the ambit of CPEC. It is crucial to determine the benefits of such projects to all its stakeholders, which not only include the private sector and the government but also the general public. As Pakistan undertakes investments primarily to improve the existing infrastructure of motorways and power plants, there is likely to be a 'spillover effect' into all sectors of the economy. One of the benefits of having an efficient transportation system is that it reduces the travel time not only between the ports and the commercial and industrial centers, but also between agricultural lands and their markets. Further, it also reduces the transit time for labor that commutes within the cities, increasing their productivity levels as more time can be allotted to both work and leisure activities. Therefore, the role of research institutions is essential in not only determining the costs and benefits of investment projects at the micro-level but also recommending policies that increase the productivity levels of the workforce and the capital employed. The World Development Indicators provides information on the research and development expenditures as a percentage of GDP. Interestingly, the world average has remained consistently between 1.99 in 1996 and 2.13 in 2012. Pakistan peaked at 0.63 in 2007. On the other hand, the value for China has consistently increased, from 0.57 in 1996 to 2.02 in 2013. The Global Innovation Index (GII) ranks Pakistan at 113 out of 127 countries, below Ivory Coast, Ethiopia and Madagascar. On the other hand, India is ranked 60 and China is ranked 22. The Atlas of Economic Complexity by the Center for International Development at Harvard University ranks Pakistan at 100 out of 124 countries, below Zambia, Cameroon and Uzbekistan. This index is calculated by considering the diversity in the number of products and its ubiquity, which is the number of other countries that can produce the same product range as Pakistan.

The indicators on human capital and research present a grim picture of the research and development activities within Pakistan. The Pakistan State of Future Index indicates research and development expenditures to equal 0.479 per cent of the GDP in 2027 (Graph and Forecasted Data Annexed). An optimistic outlook should increase research and development expenditures as a percentage of GDP to 0.6, while a more plausible outlook suggests a value ranging between 0.3 and 0.4. The following are some recommendations to increase the research and development as a percentage of GDP to its optimistic outlook of 0.6.

First, the Higher Education Commission (HEC), which regulates the quality of higher education and stresses on the importance of better research output in universities, must provide greater incentives to researchers who focus on issues related to Pakistan. For instance, universities with strong industry linkages must be rewarded particularly if their research output is relevant to the stakeholders across all economic sectors. Investments by the private sector organizations, think tanks, and trade bodies and associations must be encouraged in developing specific research funds and avenues for research collaborations.

Second, HEC must focus on applied research and experimental development (as defined in WDI), rather than on basic research to create new knowledge that is not only likely to be flawed due to the poor quality of educational and research institutions but also risk being irrelevant to other researchers and the society in Pakistan. Applied research and experimental development that is Pakistan-specific, even if it replicates research ideas developed in more advanced countries, must be encouraged and provided monetary incentives. This will also likely increase the percentage of research and development expenditures to GDP.

Lastly, the undergraduate-level university education must include courses on the improvement of writing and analytical skills as well as courses that introduce students to major issues being faced by the Pakistani society. HEC and the relevant accreditation bodies must design a curriculum that does not solely concentrate on their specialization courses. For instance, engineering

and medical programs must include courses that improve the writing and analytical skills of young researchers as well as introduce them to courses that discuss the most important issues faced by the society in Pakistan. This will help develop research ideas in their respective fields that are more meaningful to the Pakistani society and increase the returns on research and development expenditures.

STEEP CLASSIFICATION OF VARIABLES

"In the march of civilizations and nations if you can not look back from where you started, and then again look forward where you are heading, you may as well keep working in circles or spirals with incremental advancement, in the shape of expanding diameters or winding spirals. But if you are lucky to have a binocular or telescope and a source of long-range spotlight, you have the ability to carve multiple pathways in the most economical and efficient manner. The availability of data at global proportions with the technology that not only can process it fast, but also intelligently project the likely emerging trends, with the help of artificial intelligence, is one critical tool for the decision-makers." - **Lt Gen (Retd.) Naeem Khalid Lodhi, Center for Global and Strategic Studies**

Since the beginning of the study, the variables were being put through an intensive STEEP (Social, Technological, Economic, Environmental, Political) review with the internal teams, the collaborative network, and the members of the policy network. The variables were categorized under strands that included: Social, Technological, Economic, Environmental and Political. This exercise was carried to make better sense of the variables through an entirely different prism, this was not part of the over all SOFI methodology but an additional technique which the team found reasonable to be used when computing PK-SOFI in subsequent years. More deepened understanding will be developed over the next year. The technique applied as an experiment in the inaugural report is an attempt to encourage the decision-makers to explore deep and to think longer-term about the environment in which these variables as combination or independently may impact the overall assessment of the country's future. This consideration is to imagine the drivers of change that are most likely to become more dominant over time, an aspect of which will be covered in the Trend Impact Analysis. This analysis will cover future developments that might occur which could affect Pakistan's State of Future; exploring unexpected events that will change the extrapolations of the variables. This will further enhance Pakistan State of Future Index analysis.

STEEP

S

- Food availability (Kcalories/cap/day)
- Homicides, intentional (per 100,000 population)
- Infant mortality (deaths per 1,000 live births)
- Malaria – Confirmed with Microscopy

T

- Internet Users (per 1,000 population)

E

- GDP per capita (constant 2000 US$)
- GDP per unit of energy use (constant 2000 PPP $ per kg of oil equivalent)
- Literacy rate, adult total (percent of people aged 15 and above)
- Population growth (annual %)
- Poverty headcount ratio at $1 a day (PPP) (percent of national population)
- Tertiary Education (Universities)
- R&D Expenditures (percent of national budget)
- Imports (Millions US $)
- Exports (Millions US $)
- Federal Taxes (Total) (Millions)
- Inflation, consumer prices (annual %)

E

- CO2 emissions (percent of global emissions)
- Energy produced from non-fission, non-fossil sources (percent of total primary national energy supply)
- Forest Lands (percent of national land area)

P

- Freedom Level (0-100)
- Levels of Corruption in Public institutions (as measured by Transparency International surveys)
- Life expectancy at birth (years)
- Number of refugees displaced from the country (percent of national population)
- People killed or injured in terrorist attacks (percent of national population)
- Physicians (per 10,000 people)
- Population lacking access to improved water sources (percent of national population)
- Seats held by women in national parliament (percent of all national members)
- Total Debt Service (percent of GNI)
- Unemployment, total (percent of national labor force)

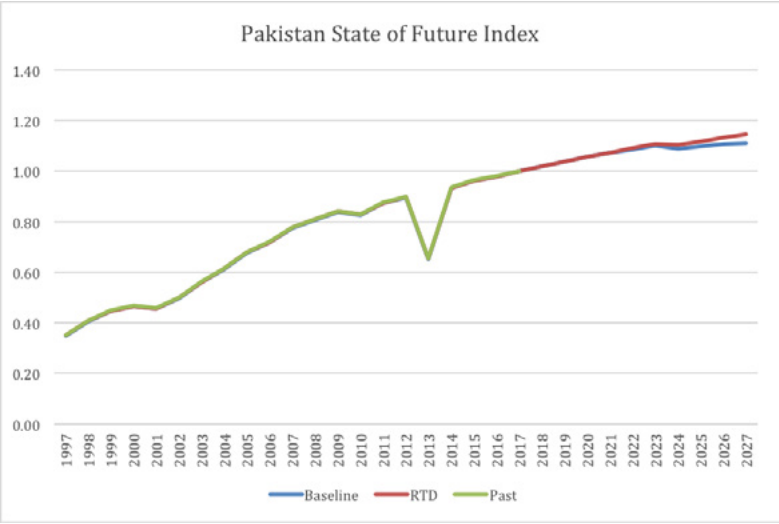
SOCIAL SPHERE

- Food availability (Kcalories/cap/day)
- Homicides, intentional (per 100,000 population)
- Infant mortality (deaths per 1,000 live births)
- Malaria – Confirmed with Microscopy

"Family is the fundamental unit of the society and this unit defines the overall theory, behavior and character of the society. When we talk about the future we must understand the importance of family planning institutes and the dominating role of religion in our society. It is time we take on the responsibility to initiate a debate where people have a dialogue between and amongst civilizations so we advance the purpose of human spirit." – **Dr. Samia Raheel Qazi, Member Council of Islamic Ideology and Director Foreign Affair Women Wing Jamaat-e-Islami Pakistan**

The two iterations of Pakistan State of Future Index show marked difference as far as social conditions of Pakistan is concerned. There is an overall growth but at a nominal rate.

"Many laws require amendments, especially the Family Law; whereby the fathers as natural and legal guardians of the minor are strictly directed to adhere to duties towards the minor but when it comes to rights they get a minimum of the same despite enduring the rigors of litigation; this creates instability in the minor which leads to social chaos." - **Advocate Jamila Jahanoor Aslam Expert in Family Law**



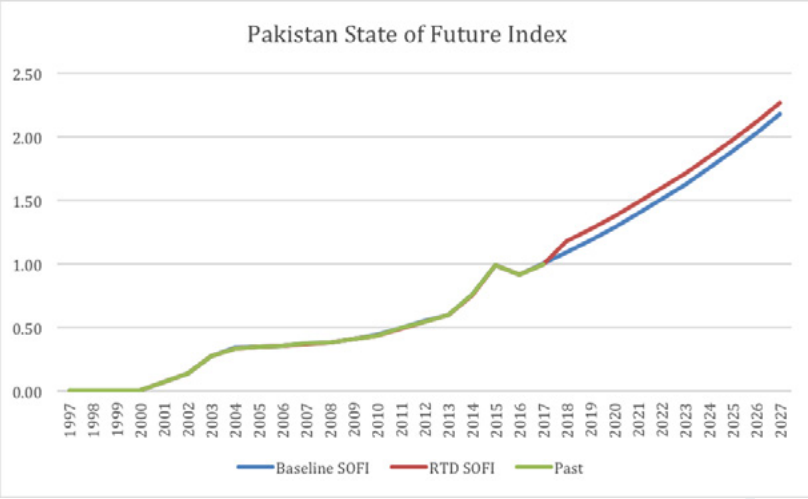
Year	SOFI (Baseline)	SOFI (RTD)
1997	0.35	0.35
1998	0.41	0.41
1999	0.45	0.45
2000	0.47	0.47
2001	0.46	0.46
2002	0.50	0.50
2003	0.56	0.56
2004	0.61	0.61
2005	0.68	0.68
2006	0.72	0.72
2007	0.78	0.78
2008	0.81	0.81
2009	0.84	0.84
2010	0.83	0.83
2011	0.87	0.87
2012	0.90	0.90
2013	0.65	0.65
2014	0.93	0.93
2015	0.96	0.96
2016	0.98	0.98
2017	1.00	1.00
2018	1.02	1.02
2019	1.04	1.04
2020	1.06	1.06
2021	1.07	1.07
2022	1.09	1.09
2023	1.10	1.11
2024	1.09	1.10
2025	1.10	1.12
2026	1.11	1.13
2027	1.11	1.15

TECHNOLOGICAL SPHERE

- Internet Users (per 1,000 population)

The initial findings suggest that the number of internet users in Pakistan is likely to grow exponentially over the next ten years. The weightage assigned in this case by the participants in the two iterations of the study was also on a higher scale.

"Consider the 'Internet' as the printing press of the past but with much greater impact. This development would be underpinning the public service delivery; health, education, agriculture, governance to name a few. Billions of things would be connected over the Internet. The Internet of Everything will drive breakthrough innovation - nations that adapt will lead, And yet, although it is difficult to predict, but we now have much greater ability to harness the potential to use this to benefit the humanity in all aspects of well-being." - **Syed Ismail Shah Chairman Pakistan Telecommunication Authority**

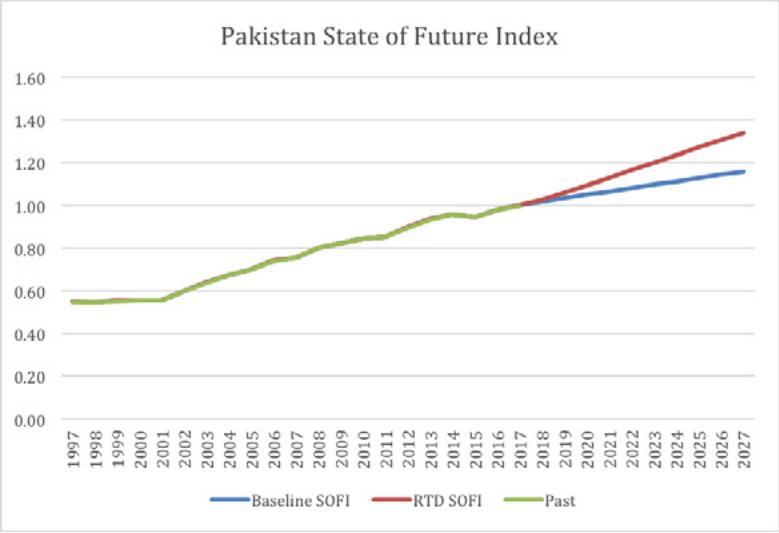


Year	SOFI (Baseline)	SOFI (RTD)
1997	0.00	0.00
1998	0.00	0.00
1999	0.00	0.00
2000	0.00	0.00
2001	0.07	0.07
2002	0.14	0.14
2003	0.28	0.28
2004	0.34	0.34
2005	0.35	0.35
2006	0.36	0.36
2007	0.37	0.37
2008	0.38	0.38
2009	0.41	0.41
2010	0.44	0.44
2011	0.49	0.49
2012	0.55	0.55
2013	0.60	0.60
2014	0.76	0.76
2015	0.99	0.99
2016	0.92	0.92
2017	1.00	1.00
2018	1.09	1.18
2019	1.18	1.27
2020	1.29	1.38
2021	1.39	1.48
2022	1.51	1.60
2023	1.63	1.72
2024	1.75	1.84
2025	1.89	1.98
2026	2.03	2.12
2027	2.18	2.27

ECONOMIC SPHERE

- GDP per capita (constant 2000 US$)
- GDP per unit of energy use (constant 2000 PPP $ per kg of oil equivalent)
- Literacy rate, adult total (percent of people aged 15 and above)
- Population growth (annual %)
- Poverty headcount ratio at $1 a day (PPP) (percent of national population)
- Tertiary Education (Universities)
- R&D Expenditures (percent of national budget)
- Imports (Millions US $)
- Exports (Millions US $)
- Federal Taxes (Total) (Millions)
- Inflation, consumer prices (annual %)

"The state of future of Pakistan is improving, given the stability in the political and stability in macroeconomic indicators." – **Gulrukh Mehboob, Institute of Management Sciences (IMS), Peshawar**

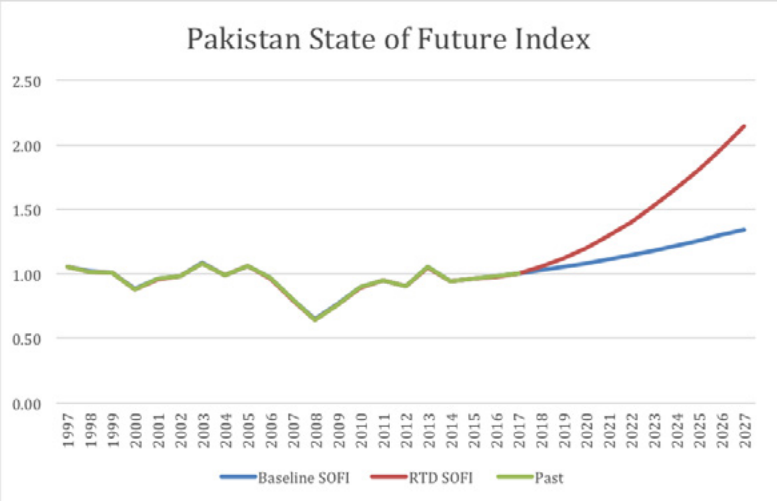


Year	SOFI (Baseline)	SOFI (RTD)
1997	0.55	0.55
1998	0.55	0.55
1999	0.55	0.55
2000	0.56	0.56
2001	0.56	0.56
2002	0.60	0.60
2003	0.64	0.64
2004	0.68	0.68
2005	0.70	0.70
2006	0.74	0.74
2007	0.76	0.76
2008	0.80	0.80
2009	0.82	0.82
2010	0.84	0.84
2011	0.85	0.85
2012	0.90	0.90
2013	0.93	0.93
2014	0.96	0.96
2015	0.95	0.95
2016	0.98	0.98
2017	1.00	1.00
2018	1.02	1.02
2019	1.03	1.06
2020	1.05	1.09
2021	1.07	1.13
2022	1.08	1.16
2023	1.10	1.20
2024	1.11	1.23
2025	1.13	1.27
2026	1.14	1.30
2027	1.16	1.34

ENVIRONMENTAL SPHERE

- CO2 emissions (percent of global emissions)
- Energy produced from non-fission, non-fossil sources (percent of total primary national energy supply)
- Forest Lands (percent of national land area)

"Structured planning tools that incorporate scientific rigor and expertise are few and far between. In this context the initiative by Foresight Lab to develop a State of Future Index for Pakistan is a pioneering achievement. The use of Realtime Delphi Technique and a broad range of variables in the ecological and social arena are prescient and persuasive. This toolkit has the potential to assist both the Pakistani government as well as international development donors in prioritizing their interventions to gain maximum impact in a resource scarce environment." – **Dr. Prof. Saleem H. Ali, Blue and Gold Distinguished Professor of Energy and the Environment University of Delaware**

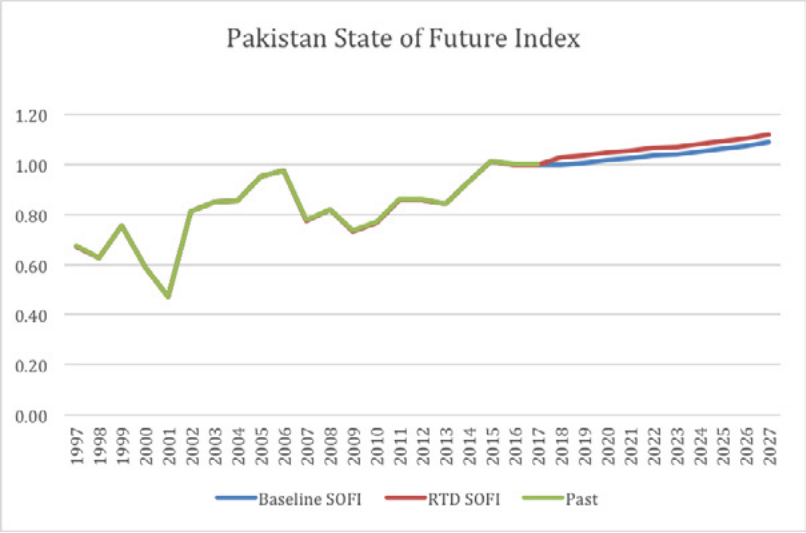


Year	SOFI (Baseline)	SOFI (RTD)
1997	1.05	1.05
1998	1.02	1.02
1999	1.01	1.01
2000	0.88	0.88
2001	0.96	0.96
2002	0.98	0.98
2003	1.08	1.08
2004	0.99	0.99
2005	1.06	1.06
2006	0.97	0.97
2007	0.79	0.79
2008	0.64	0.64
2009	0.76	0.76
2010	0.89	0.89
2011	0.95	0.95
2012	0.90	0.90
2013	1.05	1.05
2014	0.94	0.94
2015	0.96	0.96
2016	0.98	0.98
2017	1.00	1.00
2018	1.02	1.05
2019	1.05	1.12
2020	1.08	1.20
2021	1.11	1.29
2022	1.14	1.40
2023	1.18	1.52
2024	1.21	1.66
2025	1.25	1.81
2026	1.30	1.97
2027	1.34	2.15

POLITICAL SPHERE

- Freedom Level (0-100)
- Levels of Corruption in Public institutions (as measured by Transparency International surveys)
- Life expectancy at birth (years)
- Number of refugees displaced from the country (percent of national population)
- People killed or injured in terrorist attacks (percent of national population)
- Physicians (per 10,000 people)
- Population lacking access to improved water sources (percent of national population)
- Seats held by women in national parliament (percent of all national members)
- Total Debt Service (percent of GNI)
- Unemployment, total (percent of national labor force)

"Injustice, inequality and discrimination against its own citizens weaken the present and the future of any State. Pakistan is learning and adjusting to democracy. Interference in the process will only delay its success." – **Syed Ali Raza Abidi, Muttahida Qaumi Movement**



Year	SOFI (Baseline)	SOFI (RTD)
1997	0.67	0.67
1998	0.63	0.63
1999	0.76	0.76
2000	0.59	0.59
2001	0.47	0.47
2002	0.81	0.81
2003	0.85	0.85
2004	0.85	0.85
2005	0.95	0.95
2006	0.98	0.98
2007	0.78	0.78
2008	0.82	0.82
2009	0.74	0.74
2010	0.77	0.77
2011	0.86	0.86
2012	0.86	0.86
2013	0.84	0.84
2014	0.93	0.93
2015	1.01	1.01
2016	1.00	1.00
2017	1.00	1.00
2018	1.00	1.03
2019	1.01	1.04
2020	1.02	1.05
2021	1.03	1.06
2022	1.04	1.07
2023	1.04	1.07
2024	1.05	1.08
2025	1.06	1.09
2026	1.08	1.11
2027	1.09	1.12

REALTIME DELPHI (RTD) STUDY

Realtime Delphi (RTD) Method is an established method used by The Millennium Project in computation of Global State of Future Index. Realtime Delphi (RTD) is conducted online with questions pertaining to variables selected for State of Future Index.

- A space for a respondent to provide his or her numerical estimate of the priority of each item on a Likert-like scale
- A space for participants to give his/her estimate of best/worst values keeping under consideration the past data of twenty years and projected data of next ten years.
- Answers submitted by other participants in real time
- Ability to revisit his/her answers within a specified time period

The key to a successful Realtime Delphi study lies in the participation; since the results of a Delphi depend on the knowledge and cooperation of the participants. In a statistically based study, such as a public opinion poll, participants are assumed to be representative of a larger population; in the Realtime Delphi study, there is no such compulsion. The online module of Realtime Delphi was developed by AGAHI's Technology Partner Interactive Group of Companies and was opened to public on 11th August 2017 and closed on 2nd September 2017. The participants in this online study comprised of people from all walks of life, from students to business community to entrepreneurs. It was also ensured that participants are from all provinces of Pakistan along with special regions to ensure a diversity of opinion in the final result.

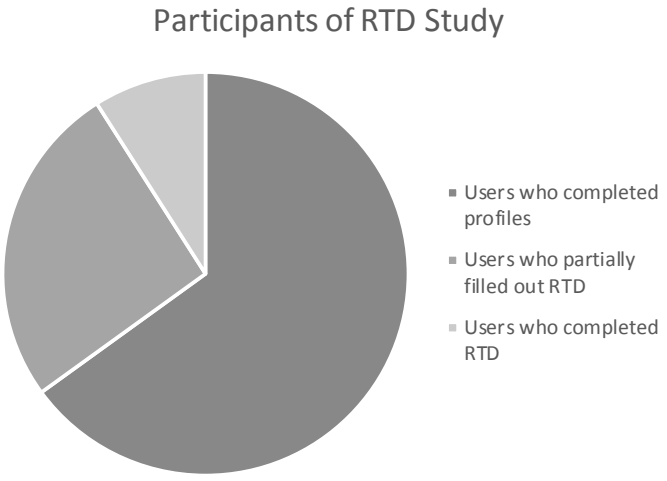
As previously mentioned, responses were updated in realtime and the participants had the choice to revisit within the specified time period of the study. To ensure further transparency, two iterations of PK-SOFI were created:

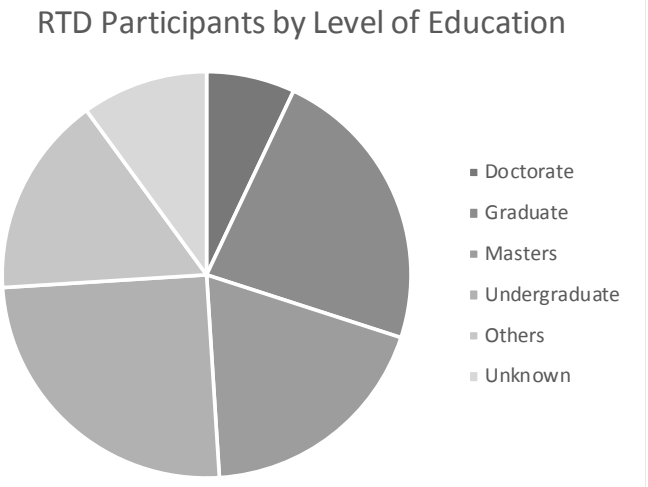
- First iteration using opinion of academics and think tanks, namely Baseline PK-SOFI
- Second iteration using the results of public Realtime Delphi (RTD) Study

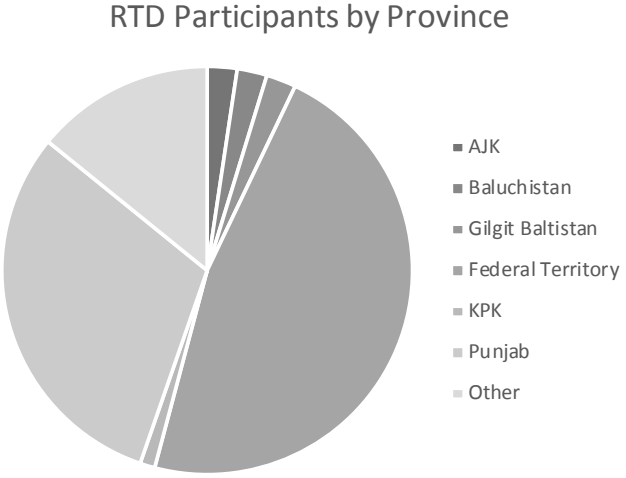
The central weakness of Realtime Delphi is its failure to attract most of its participants to re-visit their answers. The low revisit rate of participants might raise an objection that the feedback principle of Realtime Delphi is being violated, but all participants, first timer or not, see the answers given by all participants in Realtime, thus attempt to arrive at a consensus and at the same time maintain the diversity of responses. To ensure that more participants give their opinion and revisit the Realtime Delphi answers, the administrators sent out reminder emails during the study. Realtime Delphi (RTD) Method was employed because systems include: speed, flexibility, lower costs, and centralization of a data bank of questions and responses.

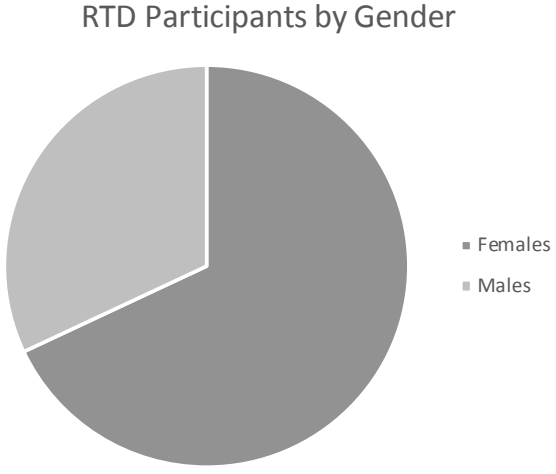
Breakdown of the Participants of Realtime Delphi (RTD) Study give an understanding of the overall participation in terms of gender, provinces, level of education:

RTD Participants	**Number**
Total Registered Users	305
Users who completed profiles	280
Users who partially filled the RTD	39
Users who completed the RTD	112


Participants of RTD Study
Users who completed profiles
Users who partially filled out RTD
Users who completed RTD

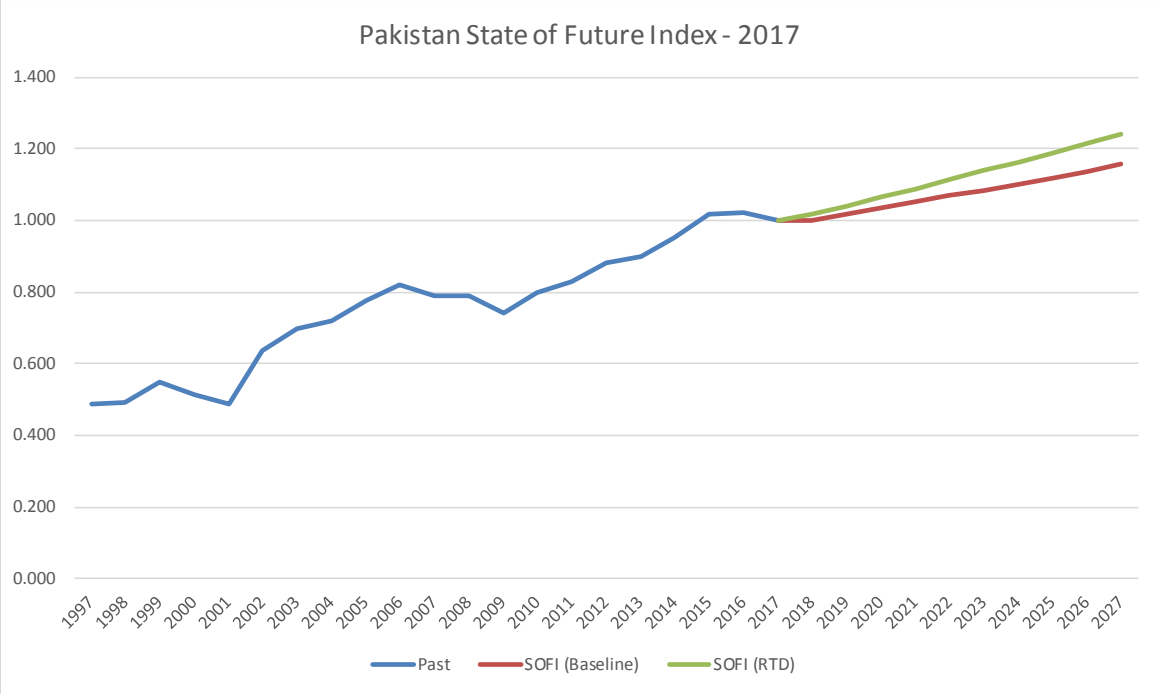

RTD Participants by Level of Education
Doctorate
Graduate
Masters
Undergraduate
Others
Unknown


RTD Participants by Province
AJK
Baluchistan
Gilgit Baltistan
Federal Territory
KPK
Punjab
Other


RTD Participants by Gender
Females
Males

RESULTS OF PAKISTAN STATE OF FUTURE INDEX (PK-SOFI)

"Pakistan State of Future Index gives a reasonable foresight and can be used to follow-up on country's progress."
- Ghazala Rafique, Aga Khan University



The results of Pakistan State of Future Index (PK-SOFI) give an overview of the past twenty years and an outlook of what the future may look like in next ten years. Certain dips in the index point from the previous years can be explained through socio-economic and political lens, which would indicate the Index's ability to accurately quantify the state of the country.

It can be observed that there is a difference in opinions of academics, think tanks and the Realtime Delphi (RTD) participants' sentiment regarding the thirty variables selected for computing PK-SOFI. The results of Realtime Delphi (RTD) Study seem to imply that the public opinion about the accumulative effect of the thirty variables is optimistic, although the accumulative growth rate of thirty variables is nominal.

HOW CAN PAKISTAN STATE OF FUTURE INDEX (PK-SOFI) HELP?

Pakistan State of Future Index (PK-SOFI) can give policymakers a clear picture of last twenty years and the potential of the next ten years. If required, every subsequent iteration of PK-SOFI can integrate more variables to encompass a wide variety of future challenges. Globally, decision-makers are moving towards a data-driven foresight research.

EVOLUTIONARY MENTOLOGY

Raza Kazim, Sadia Tariq, Iram Tauqir
Sanjan Nagar Institute of Philosophy and Arts

"Pakistan State of Future Index points up the significance of certain foundational factors that are quite often overlooked in discourses on progress and development. The importance of perspective building through synergies in diversity of opinions and approaches needs to be much emphasised. Few are those who fathom the profundity of this aspect; fewer still are aware of pertinent challenges, complexities, and impediments. This initiative is precious."
- Asif Iftikhar, Lahore University of Management Sciences

One cannot deny that man's highly developed intellect and motivational or sensitivity processes have also enabled massive unprecedented and unending material progress and productivity, scientific developments, advanced technologies and inventions, sophisticated Arts, knowledge societies, complex socio-political organizations, etc. But all this is shadowed by the post-industrial capitalist model, which is a product of the adversarial mental and emotional positions and paradigms within individuals and also in groups and institutions. Living with this dichotomy is now an acknowledged and accepted part of normal human experience in both the personal and social domains. Thus on the one hand we find immense untapped potential for harmony, happiness and progress at all levels due to the very recent tsunami of scientific and technological growth and its fallouts and consequences, and on the other the growing failure of the capitalist model to provide a holistic, stable and long-term direction to individuals and societies. The current model is anachronistic with major gaps and insufficiencies that need to be filled. That is why they are not working for the contemporary human mind and life as a whole, considering the many-sided complexity they have achieved, especially in the period of science and technology.

Factors that make these models inapplicable today are firstly, potential for material prosperity going towards the age of abundance which is challenging the foundations (based on scarcity) of the existing culture, socio-political and economic formations and structures. Secondly, the quantity and quality of the knowledge we have and are continuing to acquire about micro and macro processes is rendering past concepts and understanding obsolete and insufficient. Both these factors are bringing to light the hitherto neglected area of human focus—intelligence of man's mind and Nature's evolutionary process and the next stage of their relationship—which has to now be a critical part of any process of individual and social change.

We are looking at the issue of individual and social change from Nature's standpoint, i.e. the logic of its evolutionary journey, and breaking away from the hitherto 'humanist' approach, which has been the fundamental of all past models and movement, whether religious or socio-political. The problem with the humanist approach is that it accepts the present human being as a completed product of Nature with minor defects requiring some modifications and managing. In our view further 'evolution' of man and not 'reform' of existing man is the real issue of change.

The crisis and disintegration within and outside of man are due to his not recognizing the need for taking the next step in the direction of his evolution. Where human evolution is a part of Nature's journey from the 'dialectic of contradiction'[1] to the 'dynamic of harmony'[2], or from the random (the pre-living state of Nature) to the intelligent process (state of Nature spearheaded by the intelligently evolved intellect based mind) states. Man's further evolution will primarily take place on the mental and not biological plane: in terms of his cognitive, emotional, feeling, sensitivity processes, intelligence, intellect and will; and then his temperament and personality. It will be in terms of the change in the basic design and functioning of the contemporary operating mental complex of man and not just aspectual and superficial behavioral modifications in human mental capabilities and social structures.

There is a need to install a new design framework[3] for our mental processes and capabilities, which is driven by the mature intellect and developed sensitivity process. In order to make a new design and to restructure our existing mental processes, the need to become intelligent about the existing structure, formation, evolution and functioning of our mental processes is critical. Through this intelligence we can make mental tools required for dismantling and restructuring our existing emotional, idea, will processes and for generating (through genes and the brain processes) new mental processes and functions with new interconnections.

Today man's mind and its knowledge fund have developed to a level where it is possible to undertake this task. The human intellect and developed sensitivity process are capable of making a new mental design, a 'post-biological' (not centered in biology) design, which is derived from an intelligent understanding of the evolutionary process of Nature and its logic and how

[1] The dialectical process of motion, interaction and evolution of Nature defined and dominated by conflicts and contradictions within and amongst phenomena due to absence of knowing (in the form of evolved human consciousness). However, conflicts and contradictions are not a fundamental component of the dialectical process itself (as proposed in Marxist Materialism) but a consequence of its unconscious state.
[2] The unfolding dialectical process in which an evolved human consciousness (as a product of the next stage of its evolution) becomes its integral component. Resulting in a more harmonious and dynamic interaction and evolutionary progression of phenomena (internal and external) towards qualitatively new levels of integration, efficiency and productivity, which minimize contradictions (pain) and maximize harmony (happiness).

the human mind is integrally connected to it. In fact it is the most developed and complex product of Nature through which Nature itself is on the verge of taking the next step in its own evolution. Through the maturing of the new intellect-based human mind, Nature itself can move towards more stable, harmonious and happiness producing interactions/processes and forms. And away from the existing unstable, contradiction/conflict and unhappiness producing interactions/processes and forms, which if left unchecked will logically lead to the nemesis of the human species and also non-human forms of Nature.

Intelligent changes in the core design and functioning of the existing human mind and the ensuing formation of a new post-biological intellect based mind are a pre-requisite for any changes in the social and cultural structures and formations. A twenty-first century mature composite rationality[4] will be the foundation of the new model and movement for social change. This rationality will be able to tap the real potential of science and technology as the new means of production and use it to get rid of the real sources (material and mental) of man's misery and unhappiness and move towards higher and new forms of harmony and happiness.

Just as 'Democracy' was the cultural, economic and political system of Capitalism, the cultural, political and economic system of Science and Technology will be 'Contemporary Humanism', where 'Contemporary' means the present stage of history, which can only be understood in terms of and on the basis of past history and an understanding of the foundation of the present period i.e. logic of science and technology as means of production; while 'Humanism' means the purpose of its applications, which is for man and his prosperity. This concept is a formulation of the journey and destination of the historical process in the present and applying it to human beings is its culture, politics and economics. The idea of 'Contemporary Humanism' will be the rope that will tie all the internal components of an individual and then other individuals together. This process will gradually take the shape of a movement. And when a movement multiplies then it becomes the making of history. It produces a renaissance, which then goes on to produce a new civilization.

THE FUTURE OF PAKISTAN STATE OF FUTURE INDEX

As the inaugural SOFI for Pakistan, the Pakistan State of Future Index (PK-SOFI) is a baseline to navigate the future. Further annual iterations of PK-SOFI will provide a further clear picture of how Pakistan can navigate the future. PK-SOFI in its future iterations can include more variables that are deemed to play an important role in determining the future.

The findings presented in this report suggest that while Pakistan maintains a growth by the index standard, the growth rate is lower. Pakistan in past has faced a dip in overall value of index due to unforeseen events like terrorism and natural disasters. But a prospective mindset regarding unforeseen events is necessary to minimize the damage of such events. PK-SOFI is the first step towards creating that mindset on a national level. There should be an urgency to adopt immediate policy reforms to ensure that Pakistan is on right track with respect to anticipated future.

The objectives of Pakistan State of Future Index (PK-SOFI) are:

- To engage a select group of experts in an exercise that produces a methodical assessment of future opportunities and challenges.

- To offer decision-makers insight on expert-based perceptions, which are coupled with an outline of practical steps to capitalize on opportunities and to avert threats.

"Politics in Pakistan has remained past-based, focused on the pendulum between rule of the military and rule of the landlords. The state of the future index asks a different question: can Pakistan become futures-focused? This means: one, can a collective purposeful based vision be created; two, can politics be based on where the country wishes to be in 2048 and not where it was in 1948; three, can today's decision be based on where we wish to go, futures we wish to avoid, and the first and second order unintended consequences of these actions. In a nutshell - can Pakistan create tomorrow today?"
- Sohail Inayatullah, UNESCO Futures Chair

[3] A new hierarchical organization of specific mental processes and functions in accordance with a design purpose for which the new processes have been created in the first place.
[4] A comprehensive/holistic process of knowing and intellectual reasoning which encompasses for the first time a many-layered, in-depth understanding of mental processes as objective phenomena in addition to the existing macro and micro phenomena which have so far been the domain of philosophical and scientific rationality.

ANNEX

CURVE FITS

S. No.	Description	Type of Curve Fit	Equation	Explanation
1A	Population, total	Third Degree Polynomial	y = 26417614.244 – 39318.210*x + 19.504*x^2-0.003*x^3	Though Population of Pakistan is growing at a relatively linear rate, it was necessary to model the growth in numbers with a quadratic function to fit in data of past and precisely predict the future values
1	CO2 emissions (kt)	Quadratic	y = -838428500 + 831566.2*x – 206.1487*x^2	increased number of automotive vehicles and Pakistan's policy towards using the thermal/coal power plants in future makes it necessary to foresee a rise in Carbon Dioxide Emissions, quadratic function fits the both past and future data trends for this variable
2	Alternative and nuclear energy (% of total energy use)	Quadratic	y = -1300.444 + 1.222114*x – 0.0002850877*x^2	Pakistan produces only a nominal amount of energy from alternative/ non-conventional sources. Quadratic equation fits in the past data sets so it is considerably accurate way to predict the future trend
3	Food Production Index	Exponential	y = -32689.46 – (-55.10305/0.001614544) * (1 – e^(-0.001614544*x))	Pakistan's food production has increased over the year, with exception of 2010, and it has seen an exponential but proportional growth. Thus the reason for modelling this variable with an exponential proportional growth

CURVE FITS

S. No.	Description	Type of Curve Fit	Equation	Explanation
4	Forest area (% of land area)	Linear	y = -0.05631579*x + 115.3774	Pakistan's forest area is decreasing at a rate historically that is seeing a linear but nominal regression. Thus the modelling of this variable was done with a linear function of negative slope
5	Freedom Level (Freedom from Corruption)	Linear	y = 0.2917293*x – 561.9549	Previous data sets shows a nominal increase in Freedom levels in Pakistan. A linear function fits in perfectly the historical data and thus is a good approximation for the future
6	GDP per Capita (constant 2010 US$)	Exponential (proportional rate growth)	y = -269.6264 – (-2.950276e-10/-0.01168473)*(1 – e^(+0.01168473*x))	It will be a good question as to why this variable is modelled with an exponential function. The answer is that only a Exponential Proportional Rate function is the one providing best curve fit for data sets of the past, and thus same function was used to interpolate the future values
7	GDP per unit of energy use (constant 2011 PPP $ per kg of oil equivalent)	Exponential (proportional rate growth)	y = 0.879728 – (-1.426794e-36/-0.04048538)*(1 – e^(+0.04048538*x))	With increased energy demand in Pakistan the use of energy per capita whether domestic or industrial has and will see an exponential rise, but this exponential rise is a proportional growth rate.

S. No.	Description	Type of Curve Fit	Equation	Explanation
8	Intentional homicides (per 100,000 people)	Exponential (proportional rate growth)	y = 4.316746 – (-1.437255e-61/-0.06893383)*(1 – e^(+0.06893383*x))	An Exponential Proportional Growth rate function was the only mathematical function to give a curve for past data sets, so same function was used to interpolate future values.
9	Mortality rate, infant (per 1,000 live births)	Symmetrical Sigmoidal	y = 20.88631 + (212.2235 – 20.88631)/(1 + (x/1983.168)^73.04885)	A Symmetrical Sigmoidal Function gives a character S curve. In the given variable there is a trend of decreasing values, the mentioned function fits in the historical data set perfectly and thus is a reasonable approximation for future values
10	Individuals using the Internet (% of population)	Symmetrical Sigmoidal	y = 651.9291 + (-7.064615 – 651.9291)/(1 + (x/2067.097)^131.3464)	Modeling the increase in number of internet users by given function reasonably accommodates the historical data. A high valued exponent of 'x' gives an reasonable rise in number of internet users in future
11	CPIA transparency, accountability, and corruption in the public sector rating (1=low to 6=high)	Exponential (proportional rate growth)	y = 2.203692 – (-5.430615e-76/-0.08443532)*(1 – e^(+0.08443532*x))	An Exponential Proportional Growth rate function was the only mathematical function to give a curve for past data sets, so same function was used to interpolate future
12	Life expectancy at birth, total (years)	Linear	y = 0.2435688*x – 424.4096	The mentioned linear equation with a positive gradient gives a good approximate of increase in the life expectancy in coming years and at the same time is a good curve fit for historical data

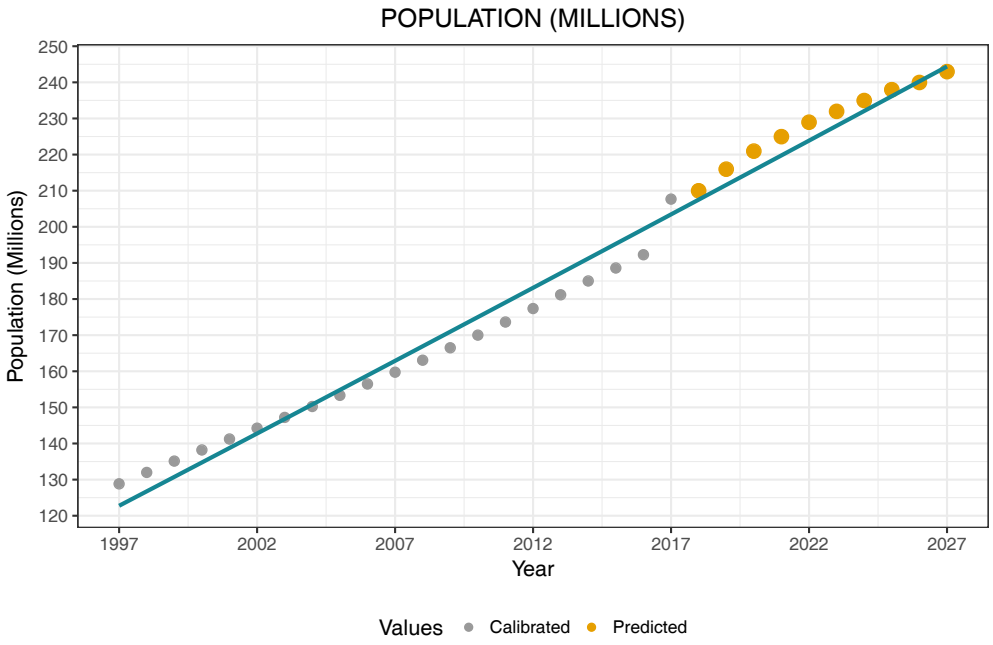
S. No.	Description	Type of Curve Fit	Equation	Explanation
13	Youth literacy rate, population 15-24 years, both sexes (%)	Exponential (proportional rate growth)	y = -32963.06 – (-70.52018/0.002103689) * (1 – e^(-0.002103689*x))	Increased number of educational institutions, gives us a exponential proportional growth in number of students enrolled at same time, the mentioned function is a good curve fit for historical data set
14	Refugee population by country or territory of origin	Linear	y = 12879.11*x – 24326290	Refugee influx is dependent on regional political and economic stability and cannot be as per say predicted accurately. It was reasonable to model this variable with a linear equation that provides a curve fit for past data.
14A	Internally displaced persons (number, high estimate)	Insufficient Data/Information		
15	People killed or injured in terrorist attacks	Gaussian (Bell Curve)	y = 6755.279 * e^(-(x – 2010.131)^2 / (2*2.974093^2))	
16	People Voting in Elections (percent of national population of voting age)	Insufficient Data/Information		
17	Physicians (per 1,000 people)	Power Curve	y = 6.438713e-90 * x^27.27862	As per the predicted values of population, the values of population growth rate were calculated directly from Variable 1A (Population - in millions)

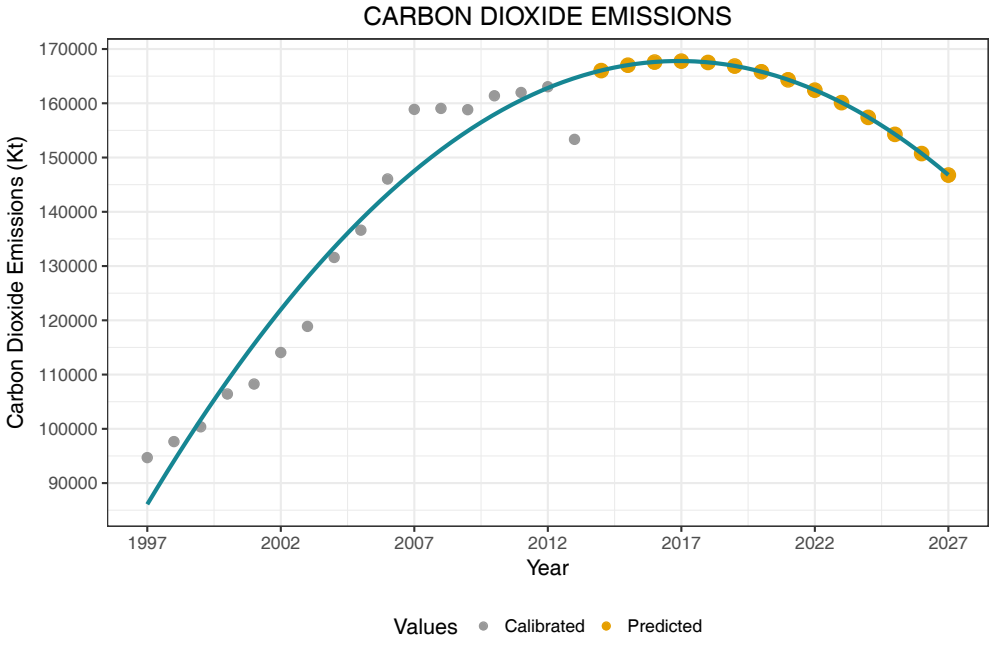
S. No.	Description	Type of Curve Fit	Equation	Explanation
18	Population growth (annual %)	Degree 4 polynomial	y = 1054209 + (-1396.269*x) + (0.5201158*x^2) + (-0.00000002138329* x^4)	Quadratic Function gives a good curve fit for historical data and thus was used to interpolate future values
19	Improved water source (% of population with access)	Quadratic	y = -3337.079 + 3.216541*x – 0.0007518797*x^2	Poverty Head Count Ratio has seen a nominal decrease over the years and a reciprocal quadratic function gibes a good curve fit for historical data sets
20	Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population)	Reciprocal Quadratic	y = (x) / ((5255833.31) + (-5257.595)*x + (1.315)*x^2)	Bell Curve was the only function available that accounted for a good curve fit for the mentioned variable. We are currently looking for more reliable data for this variable
21	Malaria – Confirmed with Microscopy (WHO)	Gaussian (Bell Curve)	y = 998929300000000*e^(-(x – 2795.084)^2/ (2*116.9985^2))	A Logistical Power Function gives a S Shaped curve. This function accounts for apparent nominal increase in value of given variable and the assumes that its value will remain relatively constant in coming years unless there is a drastic shift in policy to give preference to R&D development
22	Research and development expenditure (% of GDP)	Ratkowsky Model	y = (0.51)/ (1+ exp(8.66*10^2 – 4.3*10^- 1 9x))	The given function gives a stagnant value for R&D Expenditure, accounting for initial increase in historical data and assumes the future values to nominally increase. Unless the infra structure accommodates an increased student number

S. No.	Description	Type of Curve Fit	Equation	Explanation
23	Tertiary Education (Universities)	Sigmoidal Function	y = (1634.02) / (1 + (x/2008.41)** (-610.67))	A Bell curve is the best fit for historical data set and at the same time, the average of 5 years was used to ensure the accuracy as the legislature is elected for 5 years
24	Proportion of seats held by women in national parliaments (%)	Gaussian (Bell Curve) (average of 5 years)	y = 22.05232*e^(-(x – 2008.364)^2/(2*18.56813^2))	Data for given variable was very haphazard and at the same time it was difficult to give a perfect curve fit. Sigmoidal function was the only one to give an approximate curve fit. The given function was then used to interpolate the future values which remained relatively unchanged
25	Total debt service (% of GNI)	Symmetrical Sigmoidal Function	y = 1.961024 + (6.157176 – 1.961024)/(1 + (x/2000.902)^774.7575)	Unemployment was modelled with a multiple linear regression approach to account for factors like Youth Literacy, Year and Poverty. This is the what gave us an approximate curve fit as well as a reasonable values for the coming years
26	Unemployment, total (% of total labor force) (national estimate)	Multiple Linear Regression	y = -520.847 – 0.05552*Youth Literacy + 0.26293*Year + 0.21745*Poverty	A S shaped curve that gives a good curve fit for historical data and thus reasonable values for the future
27	Imports (Millions US $)	Asymmetrical Sigmoidal	y = 47906.07 + (10483.9 – 47906.07)/(1+(x/2003.443)^4350.01)^0.1055091	An Exponential Proportional Growth rate function was the only mathematical function to give a curve for past data sets, so same function was used to interpolate future values.

S. No.	Description	Type of Curve Fit	Equation	Explanation
28	Exports (Millions US $)	Exponential – Proportional Growth Rate	y = -153808.1 – (-0.006022598/-0.005999719)*(1 – e^(+0.005999719*x))	An Exponential Proportional Growth rate function was the only mathematical function to give a curve for past data sets, so same function was used to interpolate future values.
29	Federal Taxes (Total) (Millions)	Exponential – Proportional Growth Rate	y = -16329550 – (-0.008222326/-0.008318432)*(1 – e^(+0.008318432*x))	The historical data forgiven variable is very haphazard so it was necessary to get an approximate fitting curve, this was done by the use of power curve and consequently same function was used to interpolate the future values
30	Inflation, consumer prices (annual %)	Power Curve	y = 4.52857e-89*x^27.02094	According to the statistics provided by the state bank of Pakistan, the inflation rate in country has no established patterns and fluctuates wildly from very low to high in subsequent years. This can be attributed to inconsistent economic policy. An average of inflation over last twenty years (1997-2017) comes out to be 7.79% with values as high as 17% in 2009 and as low as 2.8% in 2002. It is projected that over the next ten years (2017-2027) the average inflation will be 9.5%. The curve fits in a reasonable manner with past data and future projections.

CURVE FITS - GRAPHS





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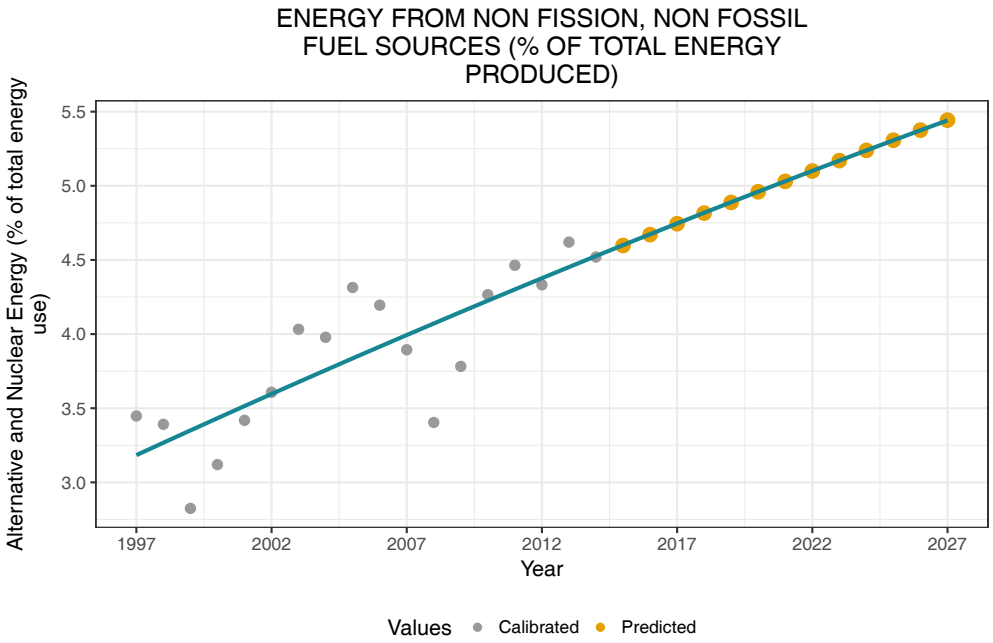

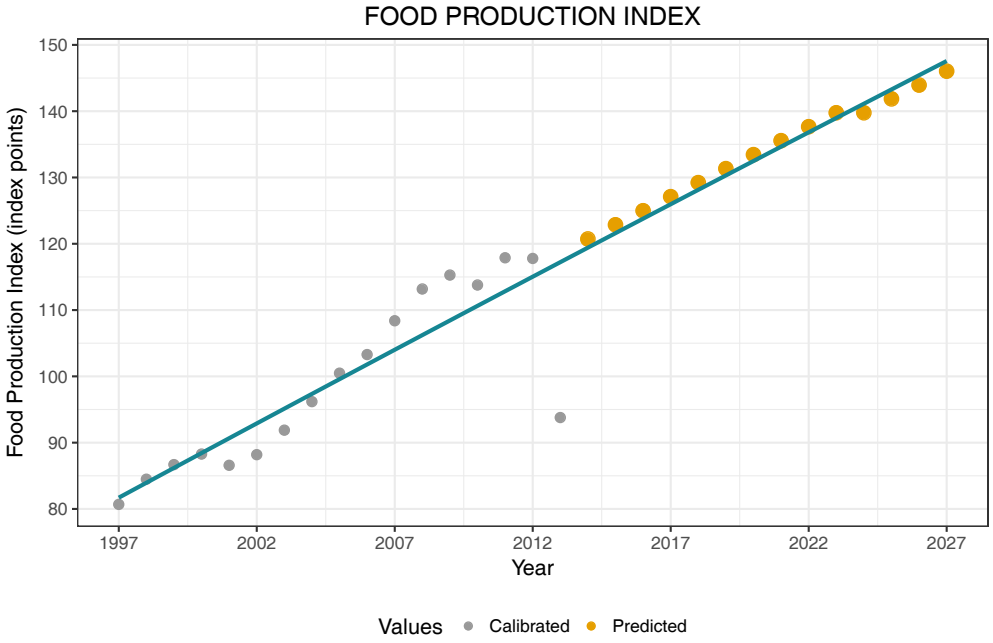

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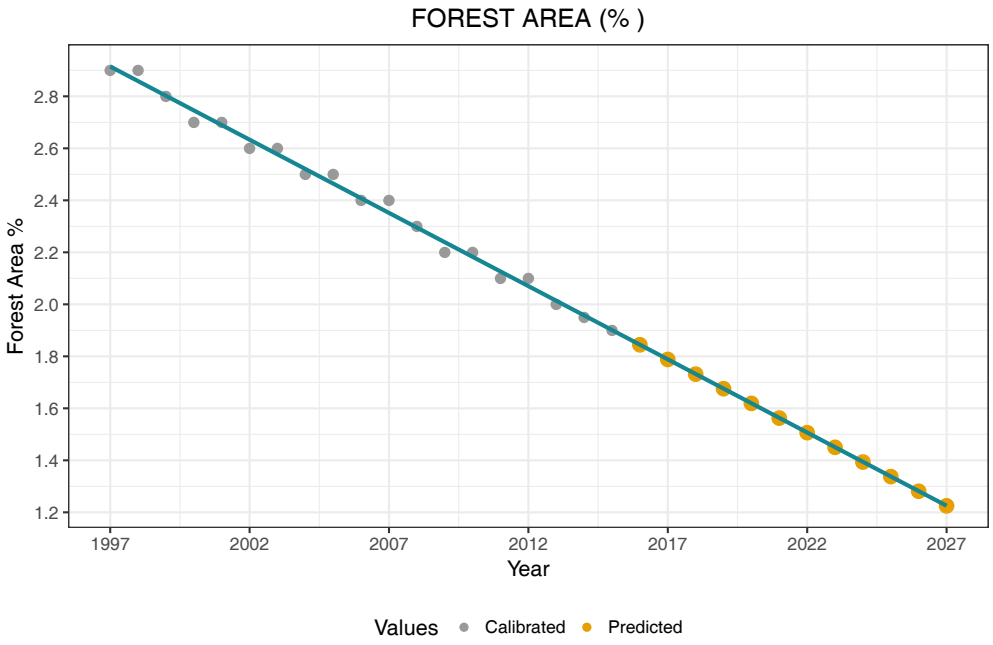

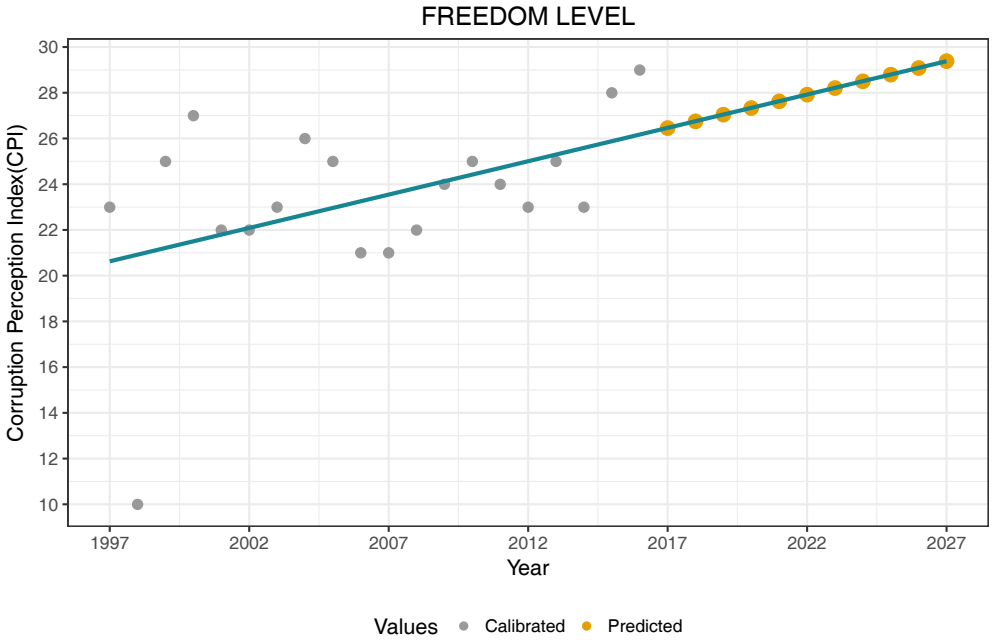

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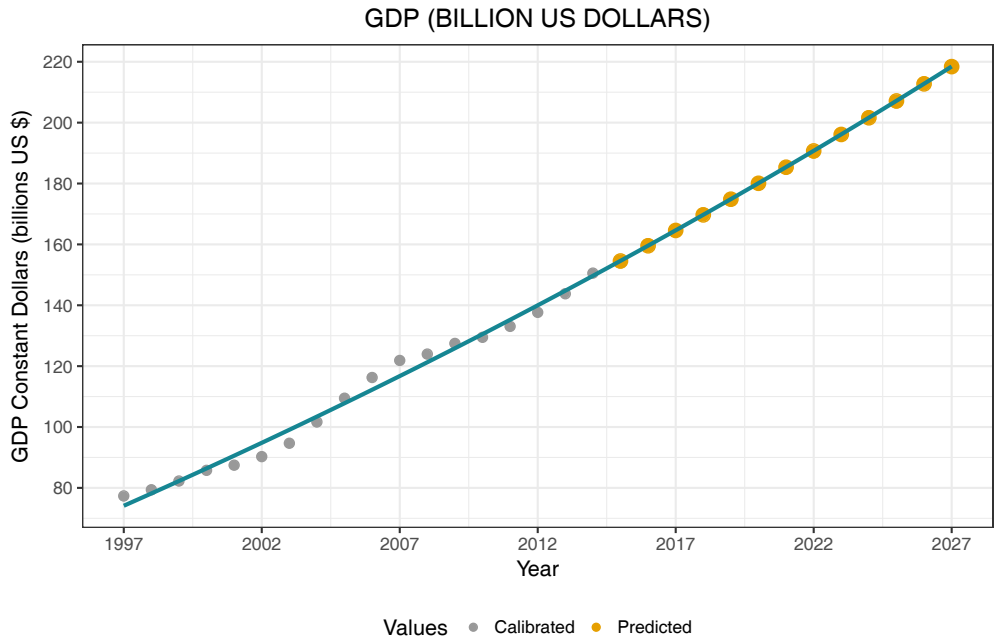
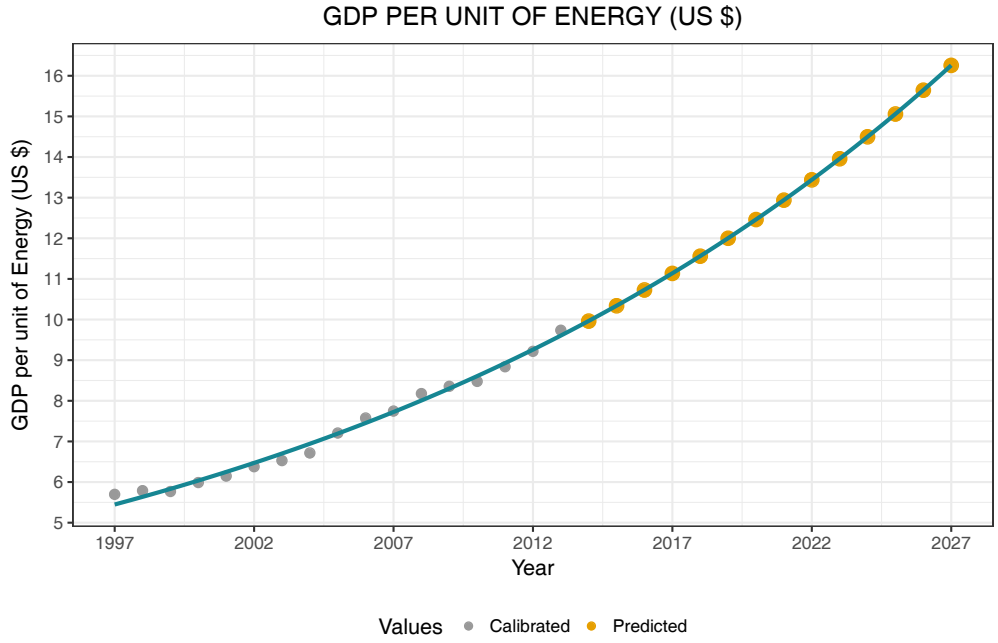
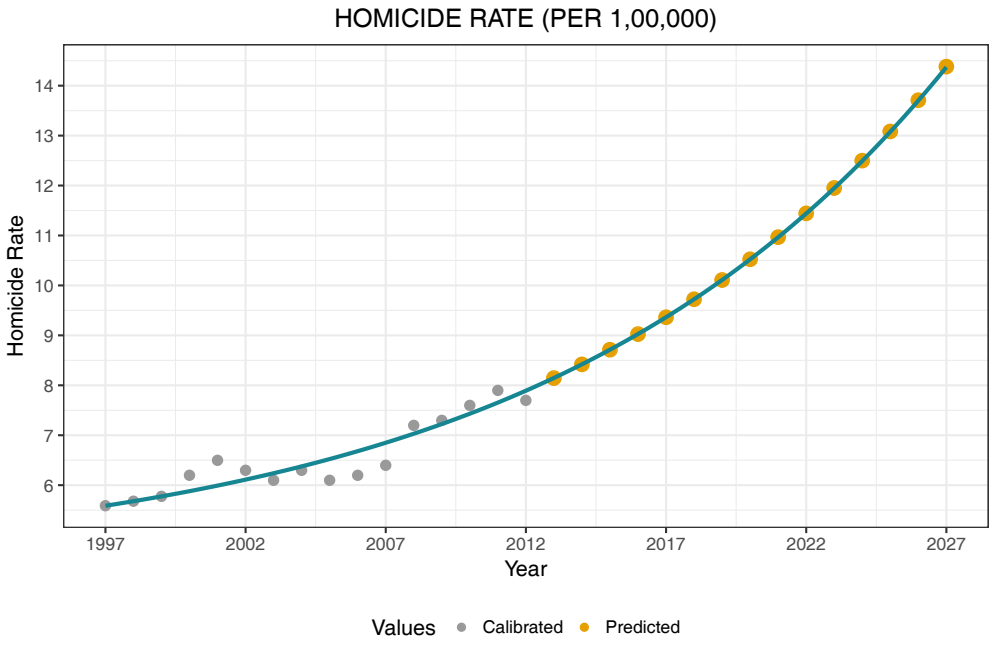
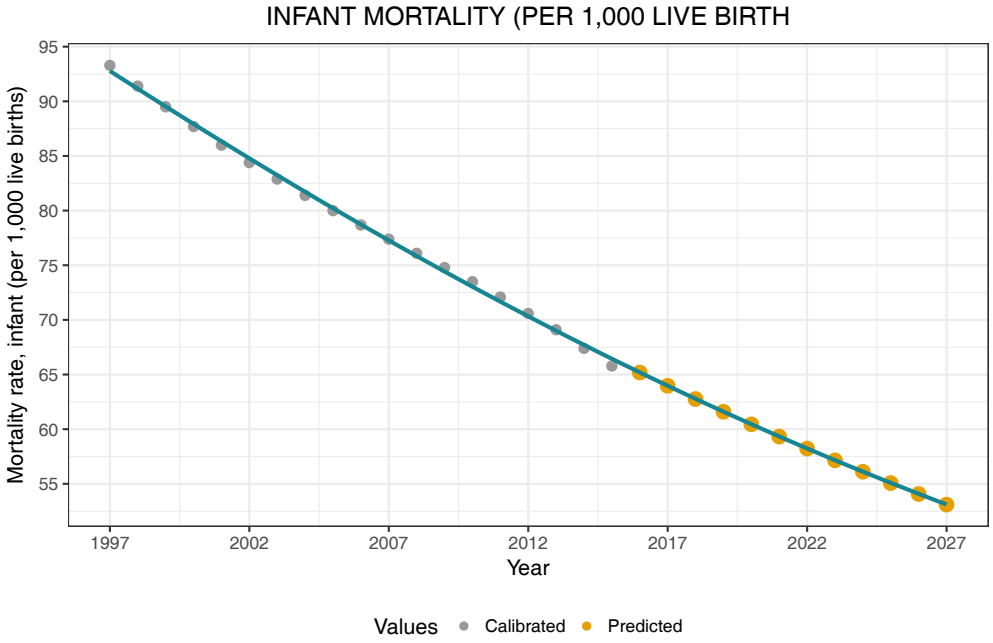


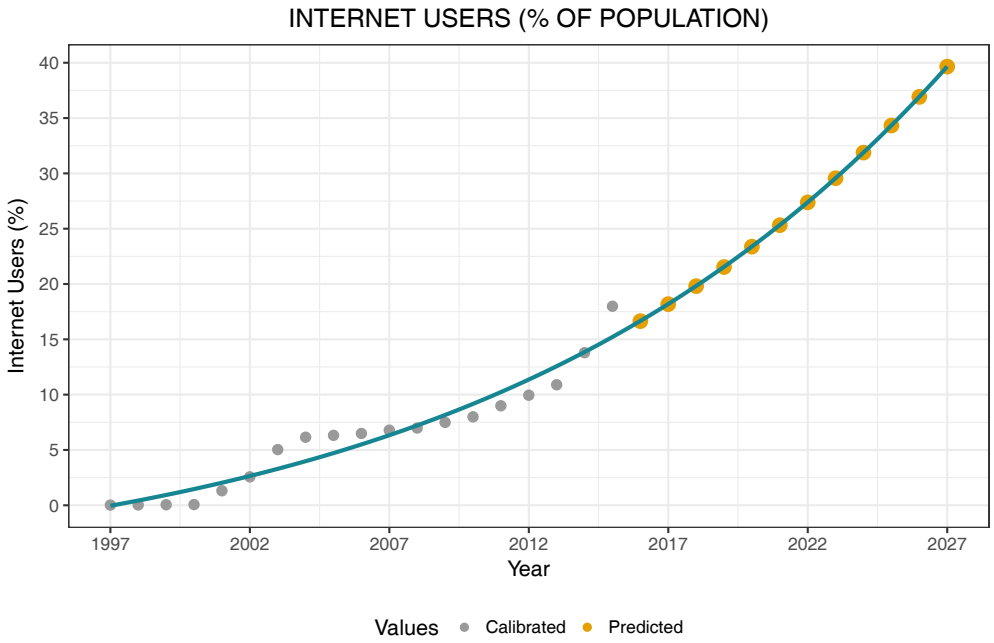


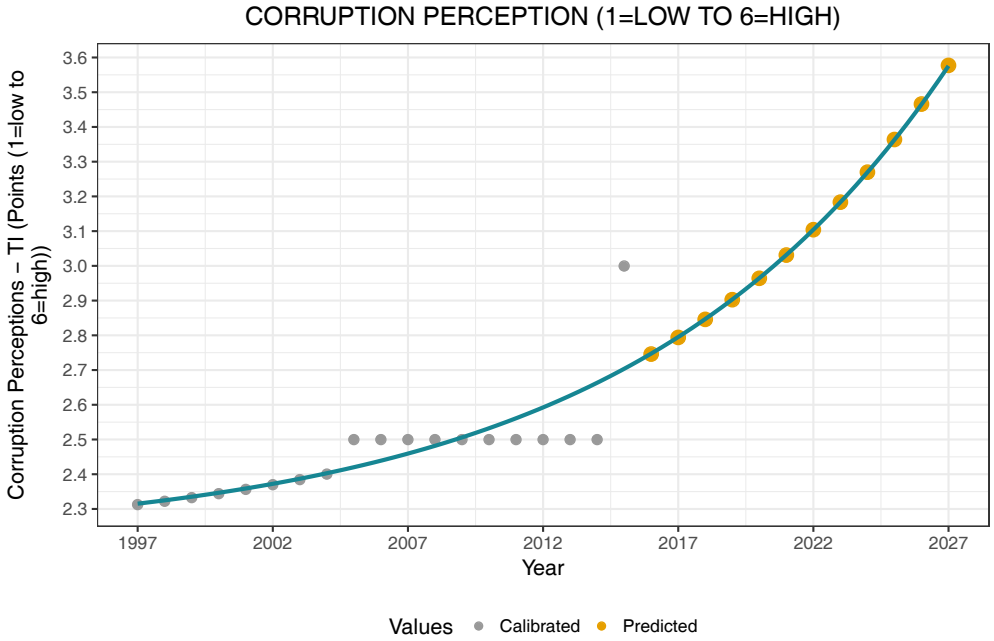
CURVE FITS - GRAPHS



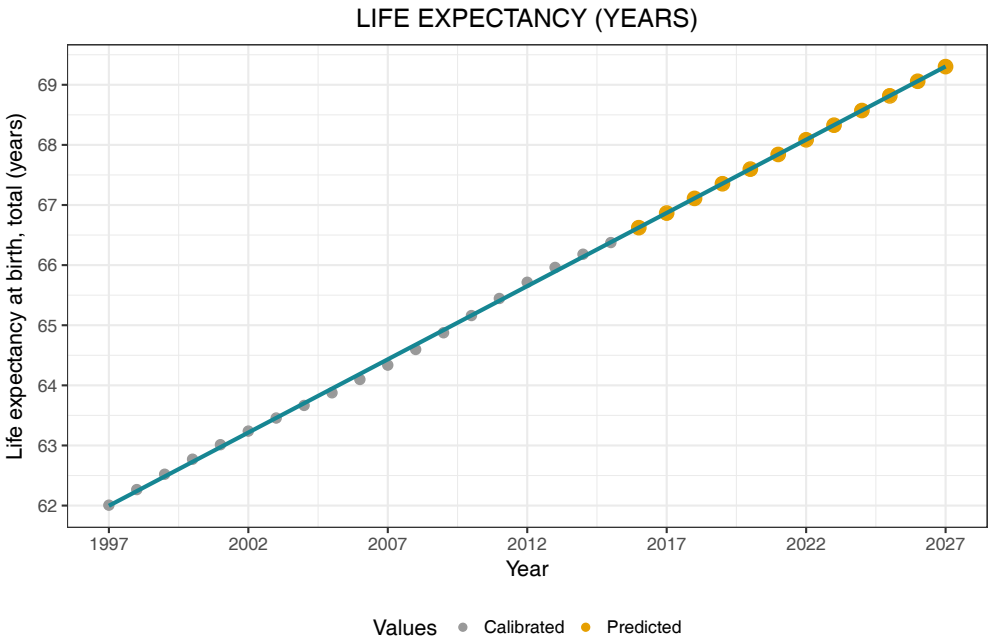


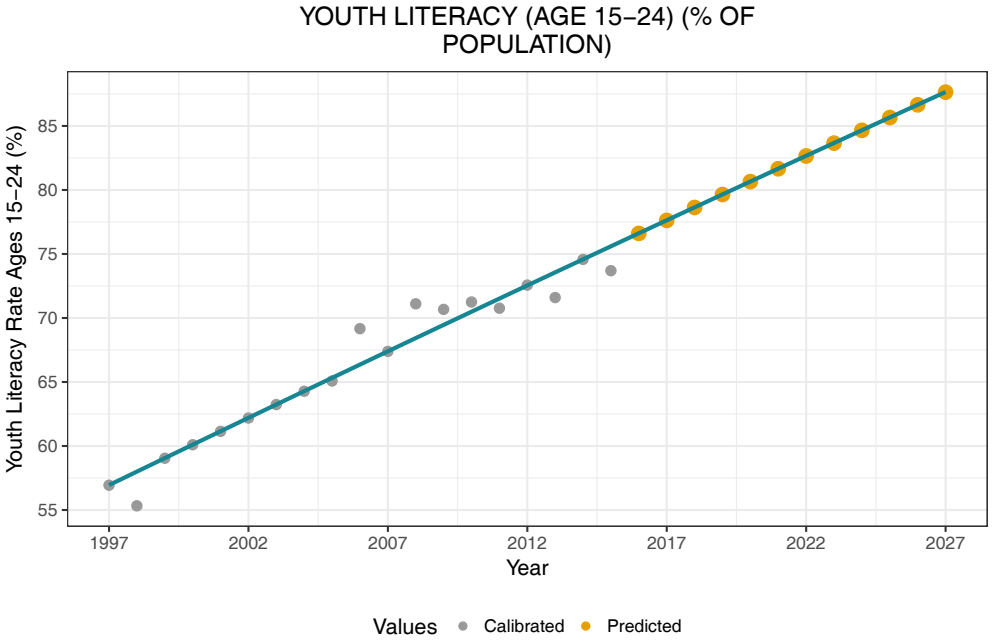
CURVE FITS - GRAPHS



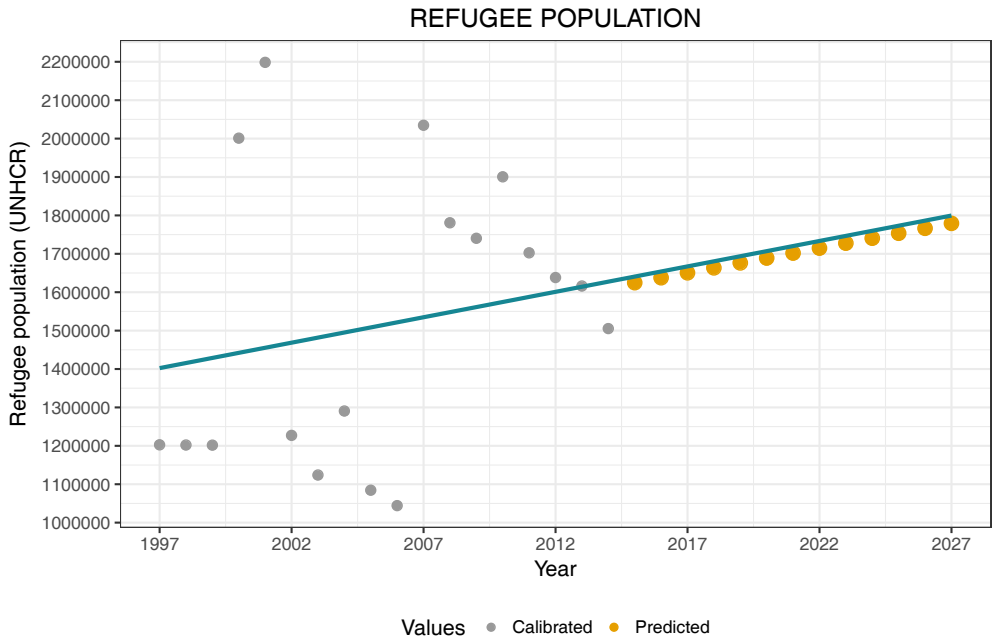


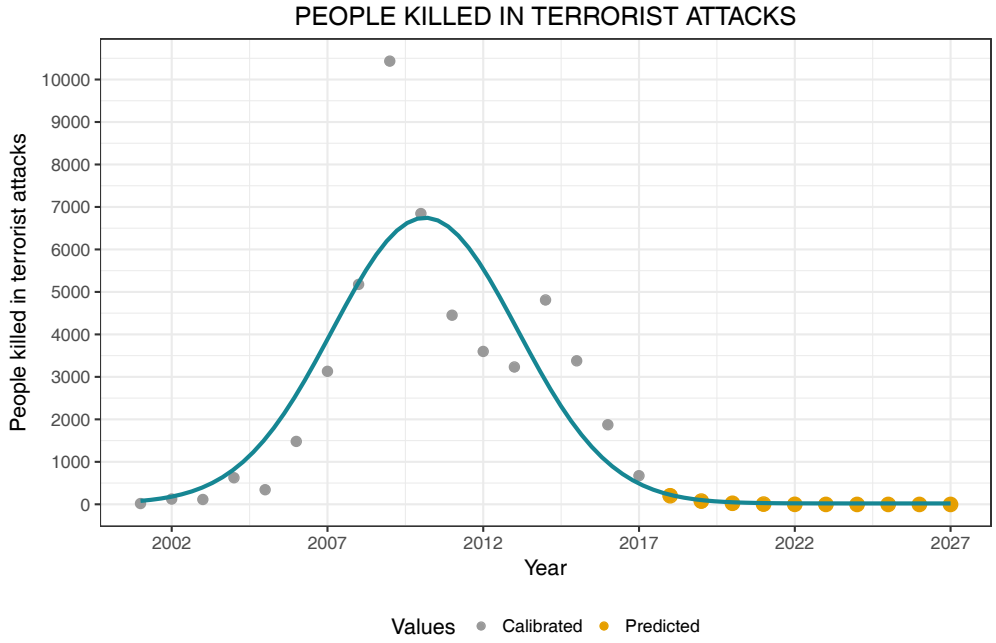
CURVE FITS - GRAPHS



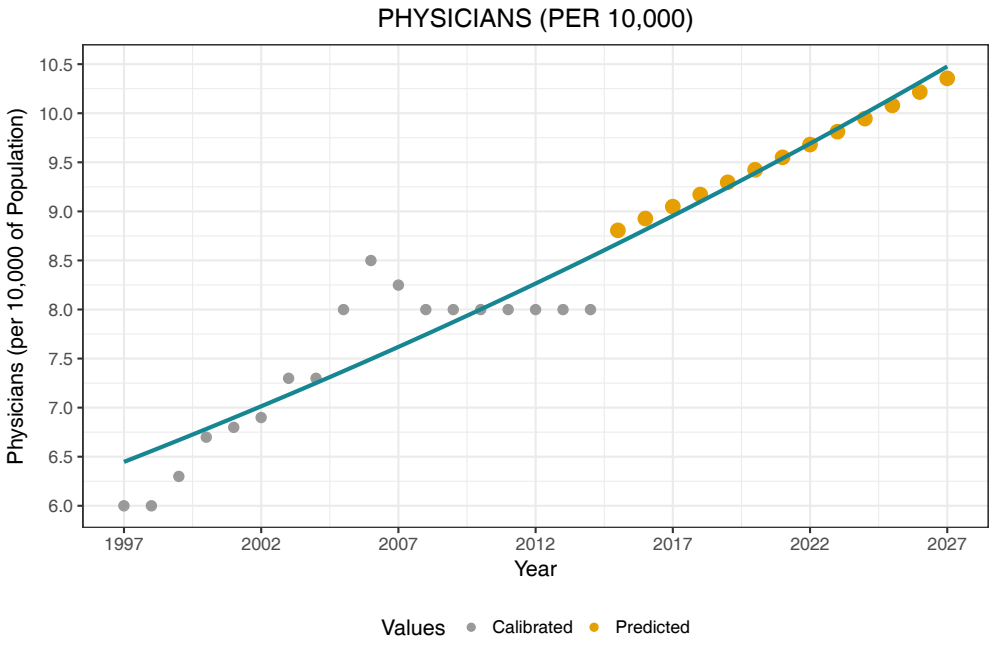


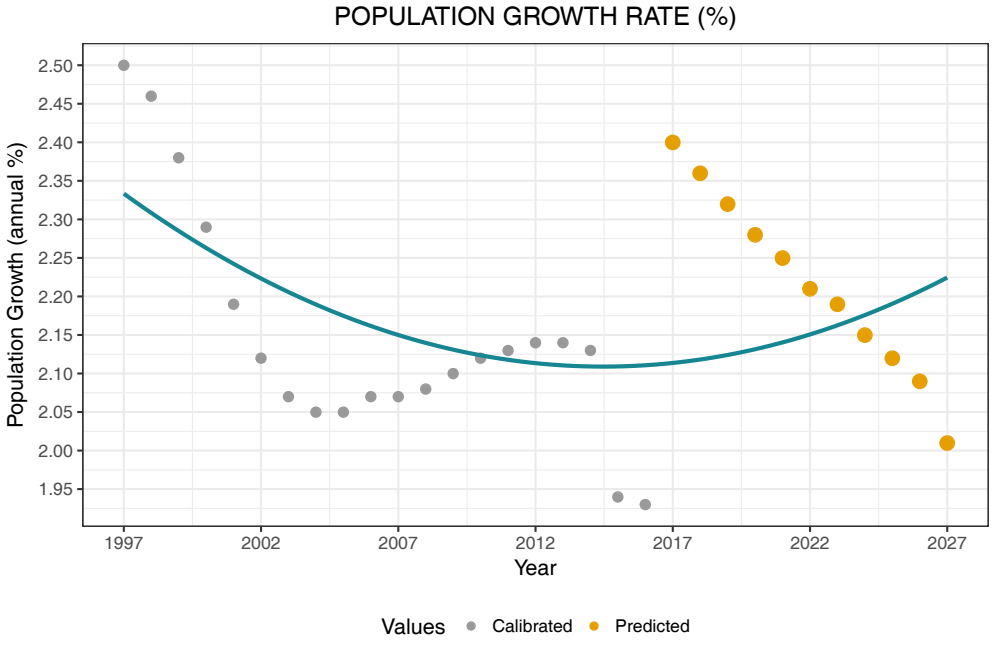
CURVE FITS - GRAPHS



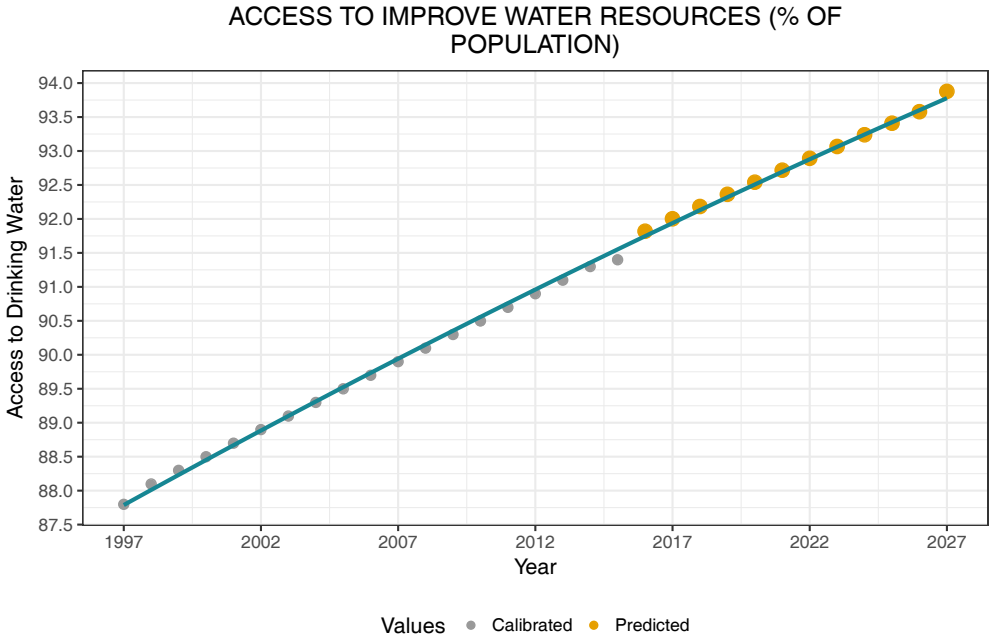


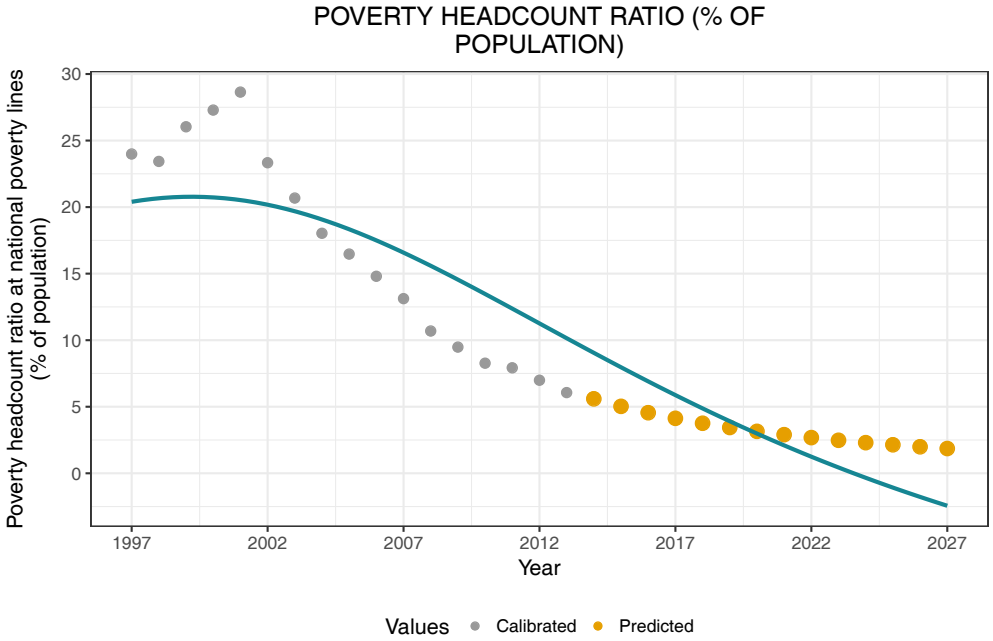
CURVE FITS - GRAPHS



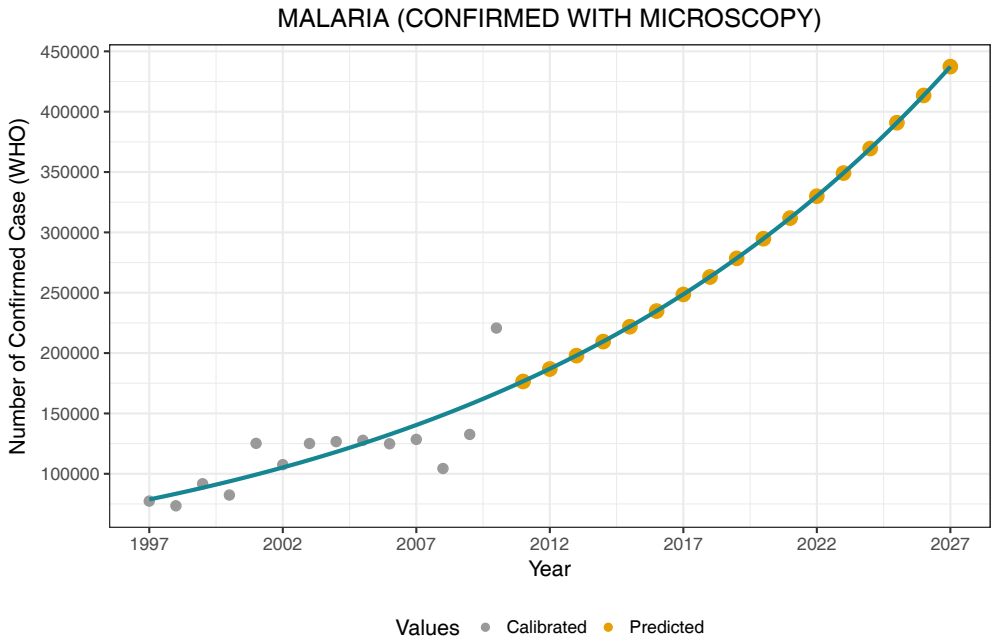


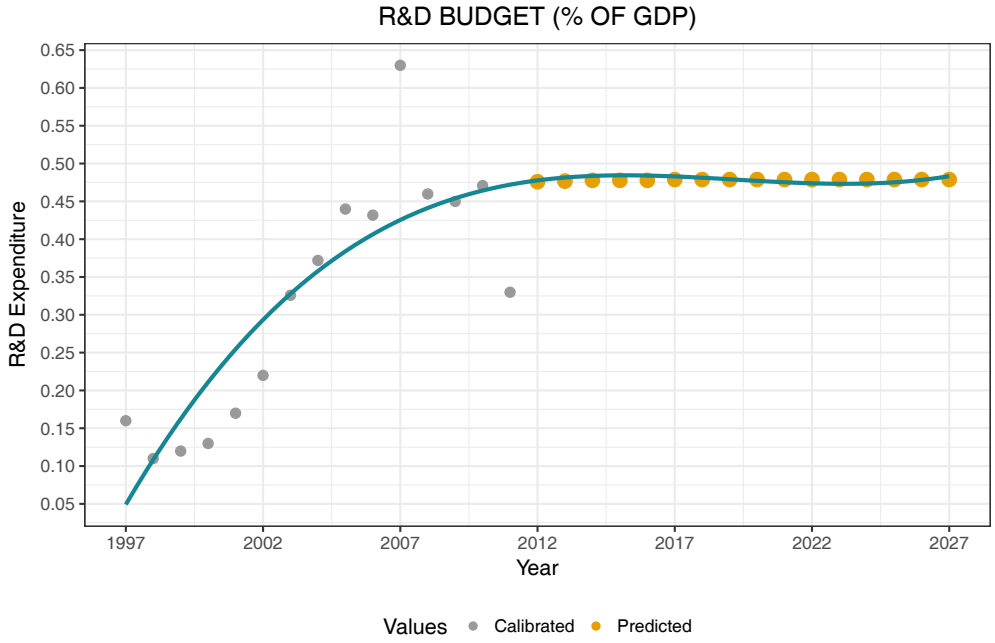
CURVE FITS - GRAPHS



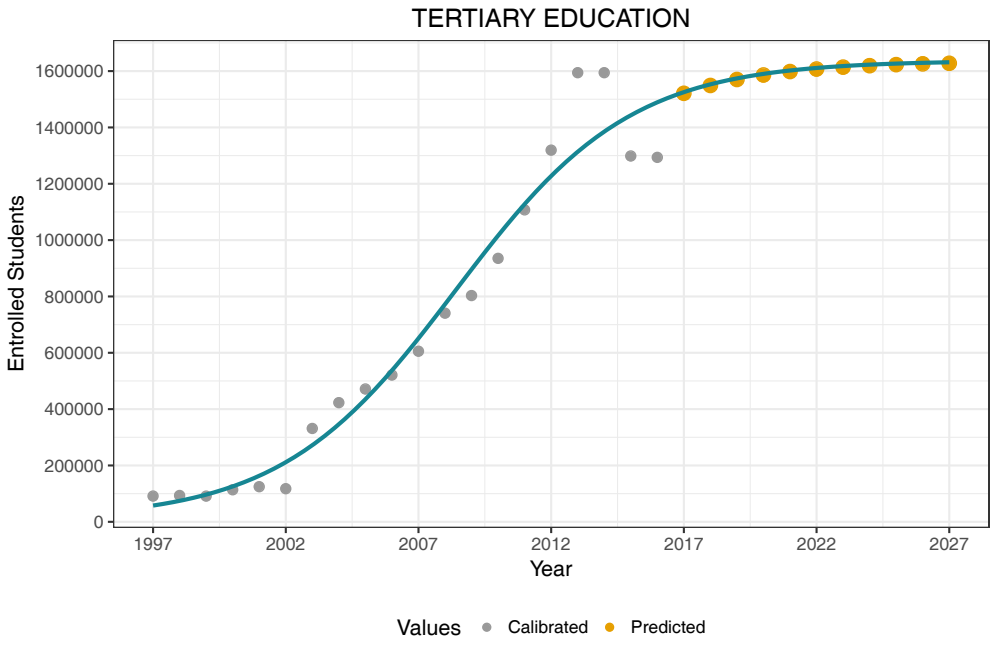


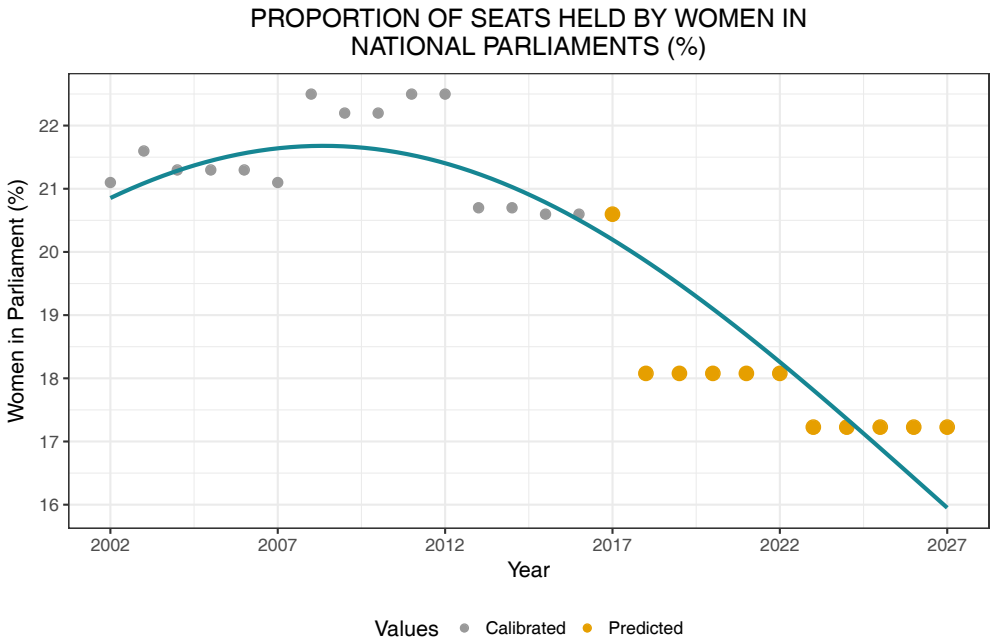
CURVE FITS - GRAPHS



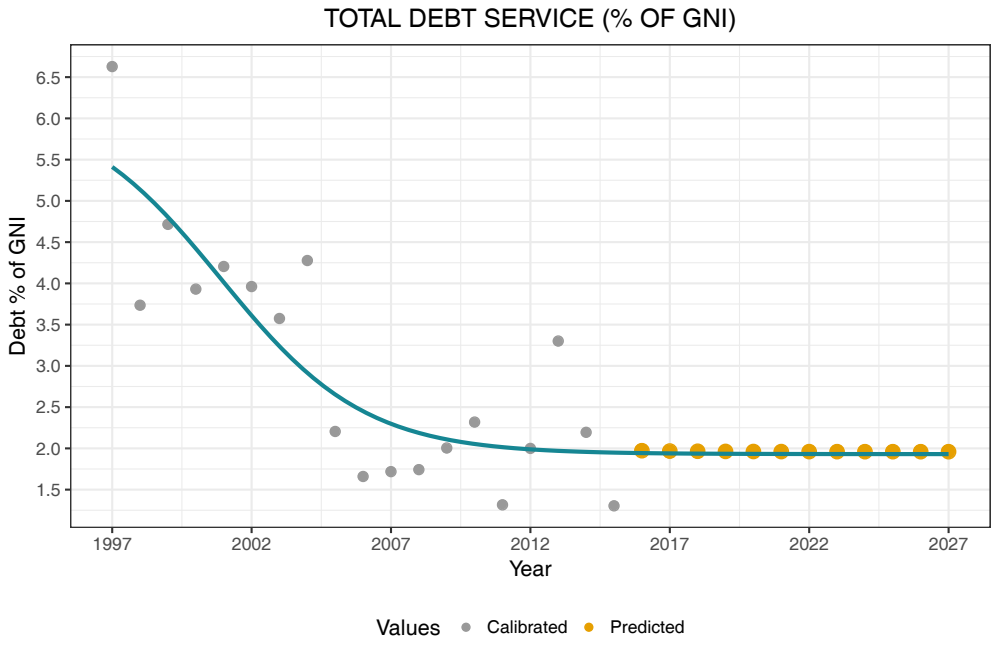


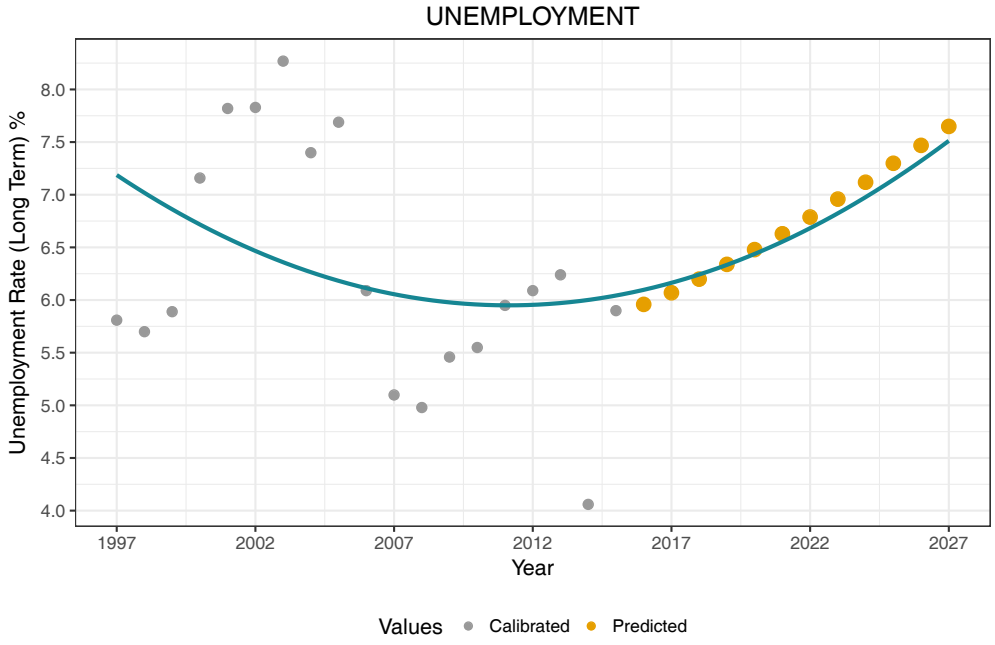
CURVE FITS - GRAPHS



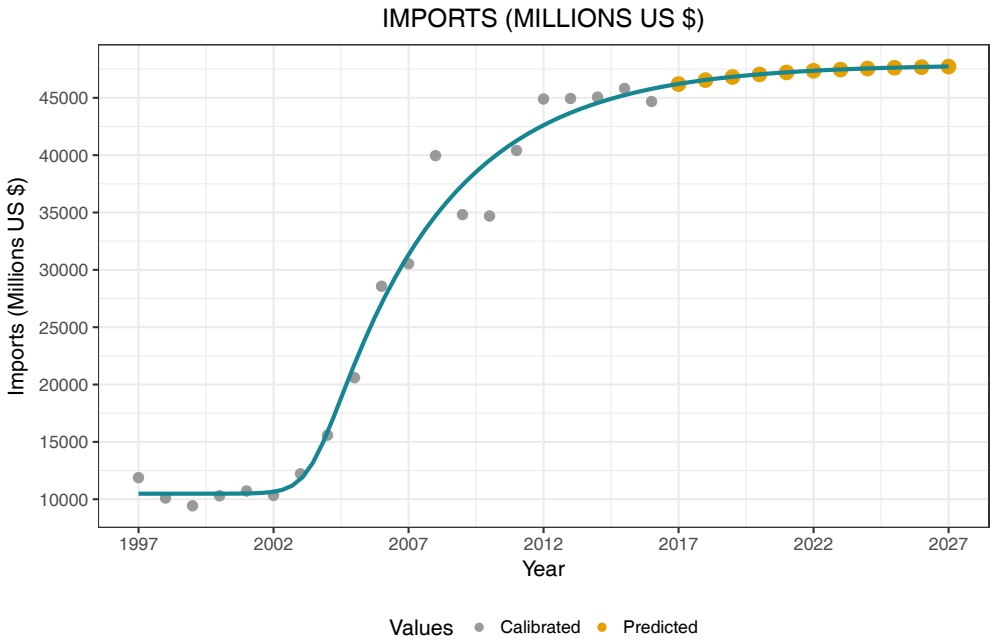


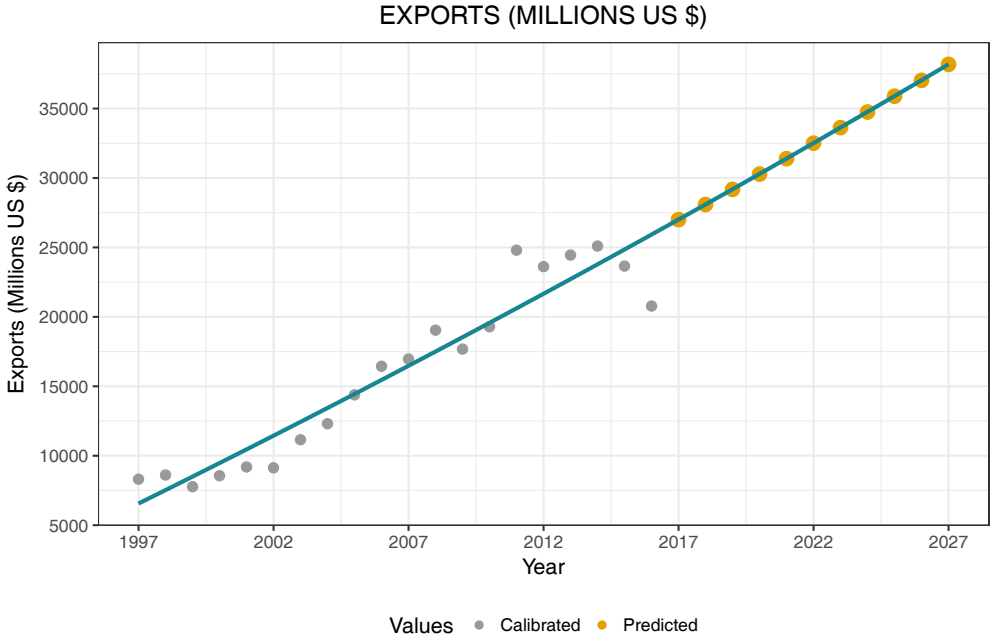
CURVE FITS - GRAPHS



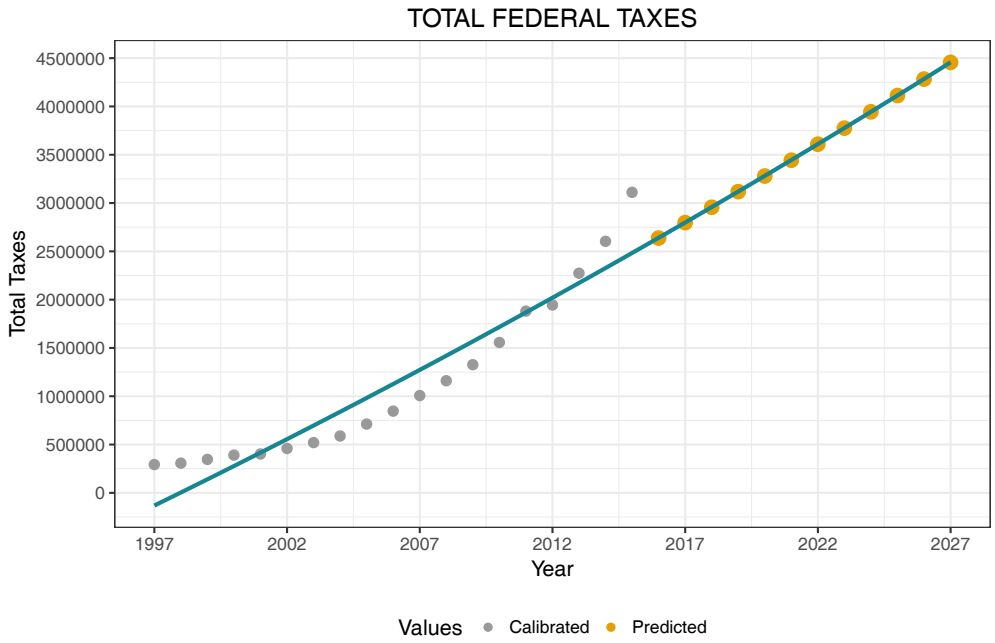


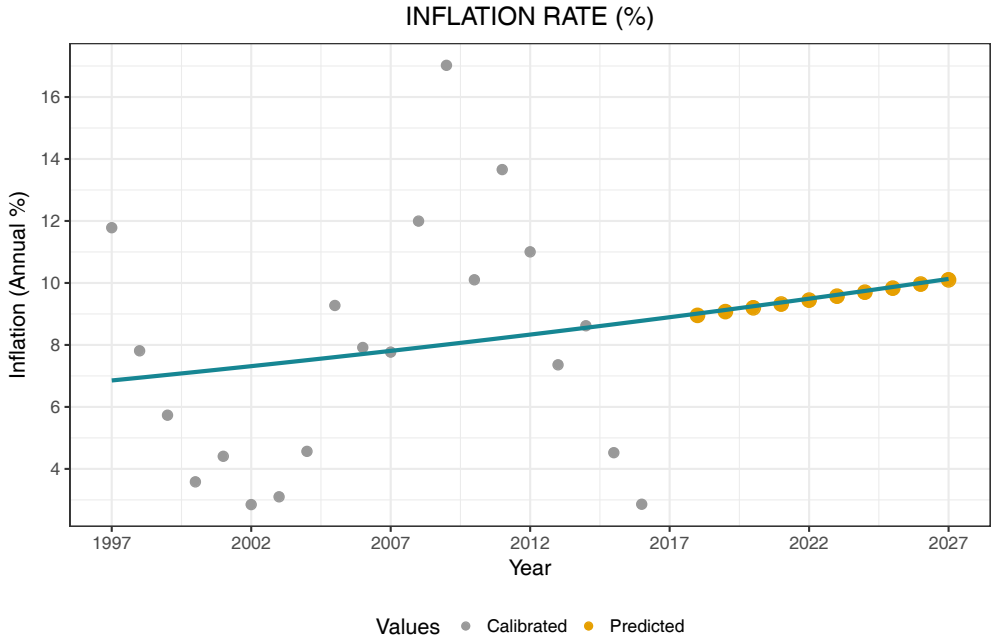
CURVE FITS - GRAPHS





CURVE FITS - GRAPHS





NON-DIMENSIONAL VALUES OF VARIABLES

Variables	Max	Min	1997	1998	1999	2000	2001	2002
Population, total	243	129	0.97	0.94	0.91	0.88	0.86	0.83
CO2 emissions (kt)	167792	94711	1.00	0.98	0.96	0.92	0.91	0.88
Alternative and nuclear energy (% of total energy use)	5	3	0.11	0.09	0.10	0.00	0.10	0.17
Food Production Index	146	81	0.00	0.05	0.09	0.11	0.09	0.11
Forest area (% of land area)	3	1	1.00	1.00	0.94	0.88	0.88	0.82
Freedom Level (Freedom from Corruption)	29	10	0.67	0.00	0.77	0.88	0.62	0.62
GDP per Capita (constant 2010 US$)	218	77	0.00	0.01	0.03	0.06	0.07	0.09
GDP per unit of energy use (constant 2011 PPP $ per kg of oil equivalent)	16	6	0.00	0.01	0.01	0.03	0.04	0.06
Intentional homicides (per 100,000 people)	14	6	0.71	0.70	0.69	0.66	0.64	0.65
Mortality rate, infant (per 1,000 live births)	93	53	0.00	0.04	0.07	0.11	0.14	0.17
Individuals using the Internet (% of population)	40	0	0.00	0.00	0.00	0.00	0.02	0.03
CPIA transparency, accountability, and corruption in the public sector rating (1=low to 6=high)	4	2	0.00	0.01	0.02	0.02	0.03	0.05
Life expectancy at birth, total (years)	69	62	0.00	0.03	0.05	0.08	0.10	0.12
Youth literacy rate, population 15-24 years, both sexes (%)	88	55	0.04	0.00	0.09	0.12	0.15	0.17
Refugee population by country or territory of origin	2198797	1044462	1.43	1.43	1.43	0.28	0.00	1.39
People killed or injured in terrorist attacks	10436	0	1.00	1.00	1.00	1.00	1.00	0.99
Physicians (per 1,000 people)	10	6	0.00	0.00	0.06	0.14	0.16	0.18
Population growth (annual %)	3	2	0.00	0.04	0.12	0.21	0.31	0.38
Improved water source (% of population with access)	94	88	0.00	0.03	0.05	0.07	0.09	0.11
Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population)	29	2	0.17	0.19	0.10	0.05	0.00	0.20
Malaria – Confirmed with Microscopy (WHO)	437449	73516	0.86	0.87	0.83	0.85	0.76	0.80
Research and development expenditure (% of GDP)	1	0	0.11	0.00	0.02	0.05	0.14	0.25
Tertiary Education (Universities)	1628210	91637	0.00	0.00	0.00	0.01	0.02	0.02
Proportion of seats held by women in national parliaments (%)	23	2	0.00	0.00	0.00	0.00	0.00	0.83
Total debt service (% of GNI)	7	1	0.00	0.54	0.36	0.51	0.46	0.50
Unemployment, total (% of total labor force) (national estimate)	8	4	0.71	0.72	0.69	0.48	0.37	0.37
Imports (Millions US $)	47731	9432	0.07	0.02	0.00	0.02	0.03	0.02
Exports (Millions US $)	38188	7779	0.02	0.03	0.00	0.02	0.04	0.04
Federal Taxes (Total) (Millions)	4457507	293631	0.00	0.00	0.01	0.02	0.02	0.04
Inflation, consumer prices (annual %)	17	3	0.37	0.65	0.80	0.95	0.89	1.00

NON-DIMENSIONAL VALUES OF VARIABLES

Variables	2003	2004	2005	2006	2007	2008	2009	2010
Population, total	0.80	0.78	0.75	0.72	0.69	0.66	0.63	0.60
CO2 emissions (kt)	0.84	0.76	0.73	0.67	0.59	0.59	0.59	0.57
Alternative and nuclear energy (% of total energy use)	0.32	0.30	0.41	0.37	0.27	0.10	0.23	0.40
Food Production Index	0.16	0.22	0.29	0.33	0.40	0.47	0.50	0.48
Forest area (% of land area)	0.82	0.76	0.76	0.70	0.70	0.64	0.58	0.58
Freedom Level (Freedom from Corruption)	0.67	0.83	0.77	0.57	0.57	0.62	0.72	0.77
GDP per Capita (constant 2010 US$)	0.12	0.17	0.23	0.28	0.32	0.33	0.36	0.37
GDP per unit of energy use (constant 2011 PPP $ per kg of oil equivalent)	0.08	0.10	0.14	0.18	0.19	0.23	0.25	0.26
Intentional homicides (per 100,000 people)	0.67	0.65	0.67	0.66	0.64	0.58	0.57	0.55
Mortality rate, infant (per 1,000 live births)	0.20	0.22	0.25	0.27	0.30	0.32	0.35	0.37
Individuals using the Internet (% of population)	0.06	0.07	0.07	0.08	0.08	0.08	0.09	0.09
CPIA transparency, accountability, and corruption in the public sector rating (1=low to 6=high)	0.06	0.07	0.15	0.15	0.15	0.15	0.15	0.15
Life expectancy at birth, total (years)	0.15	0.17	0.19	0.21	0.23	0.26	0.29	0.32
Youth literacy rate, population 15-24 years, both sexes (%)	0.20	0.23	0.25	0.35	0.30	0.40	0.39	0.40
Refugee population by country or territory of origin	1.54	1.30	1.59	1.65	0.23	0.60	0.66	0.43
People killed or injured in terrorist attacks	0.99	0.94	0.97	0.86	0.70	0.50	0.00	0.34
Physicians (per 1,000 people)	0.26	0.26	0.40	0.50	0.45	0.40	0.40	0.40
Population growth (annual %)	0.43	0.45	0.45	0.43	0.43	0.42	0.40	0.38
Improved water source (% of population with access)	0.13	0.15	0.17	0.19	0.21	0.23	0.25	0.26
Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population)	0.30	0.40	0.45	0.52	0.58	0.67	0.72	0.76
Malaria – Confirmed with Microscopy (WHO)	0.76	0.76	0.76	0.77	0.76	0.81	0.75	0.57
Research and development expenditure (% of GDP)	0.49	0.60	0.75	0.73	1.18	0.80	0.77	0.82
Tertiary Education (Universities)	0.15	0.21	0.24	0.28	0.33	0.42	0.46	0.54
Proportion of seats held by women in national parliaments (%)	0.85	0.84	0.84	0.84	0.83	0.89	0.88	0.88
Total debt service (% of GNI)	0.57	0.44	0.83	0.94	0.92	0.92	0.87	0.81
Unemployment, total (% of total labor force) (national estimate)	0.29	0.44	0.39	0.66	0.82	0.85	0.76	0.75
Imports (Millions US $)	0.07	0.16	0.30	0.51	0.56	0.81	0.68	0.67
Exports (Millions US $)	0.10	0.14	0.21	0.27	0.29	0.35	0.31	0.36
Federal Taxes (Total) (Millions)	0.05	0.06	0.09	0.12	0.15	0.18	0.22	0.27
Inflation, consumer prices (annual %)	0.98	0.88	0.55	0.64	0.65	0.35	0.00	0.49

NON-DIMENSIONAL VALUES OF VARIABLES

Variables	2011	2012	2013	2014	2015	2016	2017	2018
Population, total	0.57	0.54	0.50	0.47	0.44	0.40	0.37	0.33
CO2 emissions (kt)	0.57	0.56	0.62	0.54	0.53	0.53	0.53	0.53
Alternative and nuclear energy (% of total energy use)	0.47	0.42	0.52	0.49	0.51	0.54	0.56	0.59
Food Production Index	0.54	0.54	0.19	0.58	0.61	0.64	0.67	0.70
Forest area (% of land area)	0.52	0.52	0.46	0.43	0.40	0.37	0.34	0.30
Freedom Level (Freedom from Corruption)	0.72	0.67	0.77	0.67	0.93	0.98	0.85	0.86
GDP per Capita (constant 2010 US$)	0.39	0.43	0.47	0.52	0.55	0.58	0.62	0.65
GDP per unit of energy use (constant 2011 PPP $ per kg of oil equivalent)	0.30	0.33	0.38	0.40	0.44	0.48	0.52	0.56
Intentional homicides (per 100,000 people)	0.52	0.54	0.50	0.48	0.46	0.43	0.41	0.38
Mortality rate, infant (per 1,000 live births)	0.40	0.43	0.45	0.49	0.52	0.53	0.55	0.57
Individuals using the Internet (% of population)	0.11	0.12	0.13	0.16	0.21	0.20	0.21	0.23
CPIA transparency, accountability, and corruption in the public sector rating (1=low to 6=high)	0.15	0.15	0.15	0.15	0.54	0.34	0.38	0.42
Life expectancy at birth, total (years)	0.34	0.37	0.40	0.42	0.44	0.46	0.49	0.51
Youth literacy rate, population 15-24 years, both sexes (%)	0.39	0.43	0.41	0.49	0.46	0.54	0.56	0.59
Refugee population by country or territory of origin	0.71	0.80	0.83	0.99	0.82	0.80	0.78	0.77
People killed or injured in terrorist attacks	0.57	0.65	0.69	0.54	0.68	0.82	0.94	0.98
Physicians (per 1,000 people)	0.40	0.40	0.40	0.40	0.56	0.59	0.61	0.63
Population growth (annual %)	0.37	0.36	0.36	0.37	0.56	0.57	0.57	0.42
Improved water source (% of population with access)	0.28	0.30	0.32	0.34	0.35	0.39	0.41	0.43
Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population)	0.77	0.81	0.84	0.86	0.88	0.90	0.92	0.93
Malaria – Confirmed with Microscopy (WHO)	0.66	0.64	0.62	0.59	0.57	0.54	0.51	0.48
Research and development expenditure (% of GDP)	0.50	0.83	0.83	0.84	0.84	0.84	0.84	0.84
Tertiary Education (Universities)	0.65	0.79	0.96	0.96	0.77	0.77	0.92	0.94
Proportion of seats held by women in national parliaments (%)	0.89	0.89	0.81	0.81	0.81	0.81	0.81	0.70
Total debt service (% of GNI)	1.00	0.87	0.63	0.83	1.00	0.88	0.88	0.88
Unemployment, total (% of total labor force) (national estimate)	0.68	0.66	0.63	1.00	0.69	0.68	0.66	0.64
Imports (Millions US $)	0.82	0.94	0.95	0.95	0.97	0.94	0.98	0.99
Exports (Millions US $)	0.53	0.49	0.52	0.54	0.49	0.40	0.60	0.63
Federal Taxes (Total) (Millions)	0.34	0.35	0.42	0.49	0.60	0.50	0.53	0.57
Inflation, consumer prices (annual %)	0.24	0.42	0.68	0.59	0.88	1.00	0.78	0.57

NON-DIMENSIONAL VALUES OF VARIABLES

Variables	2019	2020	2021	2022	2023	2024	2025	2026	2027
Population, total	0.30	0.26	0.23	0.19	0.15	0.12	0.08	0.04	0.00
CO2 emissions (kt)	0.54	0.54	0.55	0.56	0.58	0.60	0.62	0.64	0.66
Alternative and nuclear energy (% of total energy use)	0.61	0.64	0.66	0.69	0.71	0.74	0.76	0.78	0.81
Food Production Index	0.73	0.76	0.79	0.82	0.85	0.85	0.88	0.91	0.94
Forest area (% of land area)	0.27	0.24	0.20	0.17	0.13	0.10	0.07	0.03	0.00
Freedom Level (Freedom from Corruption)	0.88	0.89	0.91	0.92	0.94	0.95	0.97	0.98	1.00
GDP per Capita (constant 2010 US$)	0.69	0.73	0.77	0.80	0.84	0.88	0.92	0.96	1.00
GDP per unit of energy use (constant 2011 PPP $ per kg of oil equivalent)	0.60	0.64	0.69	0.73	0.78	0.83	0.89	0.94	1.00
Intentional homicides (per 100,000 people)	0.34	0.31	0.28	0.24	0.20	0.15	0.10	0.05	0.00
Mortality rate, infant (per 1,000 live births)	0.59	0.62	0.64	0.66	0.68	0.70	0.72	0.74	0.75
Individuals using the Internet (% of population)	0.25	0.27	0.30	0.32	0.35	0.37	0.40	0.43	0.47
CPIA transparency, accountability, and corruption in the public sector rating (1=low to 6=high)	0.47	0.52	0.57	0.63	0.69	0.76	0.83	0.91	1.00
Life expectancy at birth, total (years)	0.54	0.56	0.58	0.61	0.63	0.66	0.68	0.71	0.73
Youth literacy rate, population 15-24 years, both sexes (%)	0.61	0.64	0.66	0.69	0.71	0.74	0.76	0.79	0.81
Refugee population by country or territory of origin	0.75	0.73	0.71	0.69	0.67	0.66	0.64	0.62	0.60
People killed or injured in terrorist attacks	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Physicians (per 1,000 people)	0.66	0.68	0.71	0.74	0.76	0.79	0.82	0.84	0.87
Population growth (annual %)	0.51	0.52	0.54	0.55	0.56	0.57	0.58	0.60	0.61
Improved water source (% of population with access)	0.45	0.46	0.48	0.50	0.52	0.53	0.55	0.57	0.60
Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population)	0.94	0.95	0.96	0.97	0.98	0.98	0.99	1.00	1.00
Malaria – Confirmed with Microscopy (WHO)	0.45	0.42	0.38	0.35	0.31	0.27	0.22	0.18	0.13
Research and development expenditure (% of GDP)	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Tertiary Education (Universities)	0.95	0.96	0.97	0.97	0.98	0.98	0.98	0.98	0.99
Proportion of seats held by women in national parliaments (%)	0.70	0.70	0.70	0.70	0.66	0.66	0.66	0.66	0.66
Total debt service (% of GNI)	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Unemployment, total (% of total labor force) (national estimate)	0.62	0.59	0.57	0.54	0.51	0.48	0.45	0.43	0.40
Imports (Millions US $)	1.00	1.00	1.01	1.01	1.01	1.01	1.02	1.02	1.02
Exports (Millions US $)	0.66	0.70	0.73	0.77	0.80	0.84	0.87	0.91	0.94
Federal Taxes (Total) (Millions)	0.60	0.63	0.67	0.70	0.74	0.78	0.81	0.85	0.88
Inflation, consumer prices (annual %)	0.56	0.55	0.54	0.53	0.53	0.52	0.51	0.50	0.49

ABOUT FORESIGHT LAB

The ecosystem of the new connected world does not have a separate space for nonprofit or public platforms, fenced off from commercial space. Today, the Government, Private Sector, Academia, Media and the Civil Society are required to not only be strategic but also human-centric, well coordinated and prompt in service delivery. Pakistan's future depends on the choices we create today and the decisions we make for tomorrow's generation. Without improving Pakistan's foresight outlook, the challenges that confront society today will only compound in the coming years. Foresight Lab connects the process of collective thinking building on agreed set of prioritized opportunities for prudent sustainable solutions. The protocol of Foresight Lab is intended to prepare a diagnostic framework by analyzing current challenges and henceforth preparing an introspective strategy for tomorrow. The Lab is a think ware, therefore:

- An open, systematic, participatory process that supports research design and formulation of policies as a result with a medium to long-term perspective.
- An element of strategic thinking, which informs policymaking and enables strategic planning and action into coherent implementation.
- A discourse that creates futures by examining the past trends generating collective insight without prejudicing the autonomy of individuals or organization's participating insight.

The Foresight Lab technique is not a prediction, rather it's a prescriptive-based mechanism to test assumptions, which is in itself an ongoing process of thinking through the uncharted territories forming new neural pathways to chalk out alternate possibilities. This process is continuously gauged; it reduces the element of policy failures or inaction, which as a result is not only measured but is pursued using innovative means in a manner that it is possibly diminished for achieving the right outcomes through modern day scientific approaches, while the challenges for human well-being will keep presenting themselves. This data-driven strategic foresight research development and analysis aims to deliver public good with sustainability being the guiding paradigm.

The **Objective** of the Lab is to create and foster an ecology of Foresight perspectives in Pakistan and enable decision-makers to opt for appropriate policy choices and establish strategic narrative in support.

The **Purpose** of the Lab is to apply data-driven foresight research methods and techniques that pivots on improving the well-being of the people of Pakistan.

To ensure that the inaugural report covered a nationwide pulse, a Collaborative Network was initiated that included the academia, researchers, experts and policymakers different in their nature of work, heterogeneous in terms of their operating environment, and whose interactions are supported by networked methods like Realtime Delphi (RTD) to collectively give their input on the structure, behavior, and evolving dynamics of various variables to assess the compatibility and trend impact of the shortlisted variables in the long run. The network includes:

PARTNERING ORGANIZATIONS

ISLAMABAD

National University of Modern Languages (NUML)
Dr. Gulfam Khan Khalid Baghoor
Dr. Karamat Ali

COMSATS Institute of Technology
Dr. Mansoor Shaukat
Dr. Saqlain Raza
Dr. Amna Nazeer

Quaid-i-Azam University (QAU)
Dr. Shabana Fayyaz
Dr. Ilhan Niaz

Allama Iqbal Open University (AIOU)
Dr. Saqib Riaz

International Islamic University Islamabad (IIUI)
Dr. Arshad Zia

Institute of Space Technology (IST)
Dr. Zaffar M. Khan

Institute of Policy Studies (IPS)
Khalid Rahman
Naufil Shahrukh

Strategic Visions Institute (SVI)
Dr. Zafar Iqbal Cheema
Saadia Kazmi
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Asia Institute of Public Policy
Farzana Yaqoob

Pakistan Institute for Conflict and Security Studies
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Abdullah Khan
Gul Dad

China Study Center
Syed Tanvir Jaferi

Center for Global and Strategic Studies (CGSS)
Maj Gen (Retd.) Khalid Amir Jaffery, HI(M)
Lt Gen (Retd.) Naeem Khalid Lodhi(M)
Lt Col (Retd.) Khalid Taimur Akram

IGNITE, National Technology Fund
Yusuf Hussain
Abdullah Khan
Muhammad Ali Iqbal
Khurram Saleem

BAGH

Women University of Azad Jammu & Kashmir
Ghayur Abbas
Uzma Gardazi

LAHORE

Beaconhouse National University (BNU)
Muttaqi Armaan Malik
Dr. Munawar Sabir
Dr. Muhammad Umer Hayat

Sanjan Nagar Institute of Philosophy and Arts
Raza Kazim
Saadia Tariq
Rakae Jamil

RAHIM YAR KHAN

Khwaja Fareed University of Engineering & IT

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Institute of Business Administration (IBA)
Dr. Aadil Nakhoda
Dr. Faisal Iradat

Dadabhoy Institute of Higher Education (DIHE)
Dr. Saad Ahmed Khan
Dr. Arsalan Khan
Rabia Dadabhoy

Karachi University
Prof. Dr. Moazzam Ali Khan
Prof. Dr. Abid Hasnain
Prof. Dr. Nasir Salman
Prof. Dr. Nabeel Ahmed Zubari

PESHAWAR

Institute of Management Sciences (IMS)
Dr. Muhammad Nawaz
Dr. Awais Adnan
Dr. Sajid Anwar
Dr. Adnan Amin
Dr. Shahwali Khan
Gulrukh Mehboob
Huda Munawar
Najm ul Saher

GILGIT

Karakoram International University
Tasawar Baig
Saranjam Baig

QUETTA

Balochistan University of Information Technology, Engineering and Management Sciences (BUITEMS)
Zafarullah
Dr. Nazeer Ahmed
Dr. Shahjahan
Muhammad Jawad Khan

University of Balochistan (UoB)
Dr. Abdul Malik

FUTURES COUNCIL

PROF. DR. ATTA UR REHMAN is a leading scientist and scholar in the field of organic chemistry from Pakistan, especially renowned for his research in the various areas relating to natural product chemistry. With over 700 publications in the field of his expertise, he is also credited for reviving the higher education and research practices in Pakistan. Dr. Atta ur Rahman has had a prominent record in Cambridge Overseas School Certificate in 1958, and A'Levels in 1960 from the Karachi Grammar School. In 1963, he received B.Sc (Hons.) in Chemistry, followed by M.Sc in Organic Chemistry from Karachi University. He received Commonwealth Scholarship in 1965 to study for Ph.D in Organic Chemistry under supervision of Dr. J. Harley Mason and received Ph.D at Kings College, Cambridge in 1968. He was subsequently awarded a Doctorate of Science by University of Cambridge in 1987 and Doctorate of Education by Coventry University, UK, in 2007.

PROF. SOHAIL INAYATULLAH is a Pakistani-born Australian academic, futures studies researcher and a visiting professor at the Graduate Institute of Futures Studies at Tamkang University in Taipei, Taiwan. Mr. Inayatullah is most famous for introducing and pioneering the futures technique of causal layered analysis, which uses a four-layered approach to bring about transformative change. He introduced the idea in a widely cited paper for Futures. He also edited and wrote the introductory chapter for the Causal Layered Analysis (CLA) Reader. He has also described the idea for a popular audience in an article for The Futurist and a TEDx talk.

PROF. SALEEM H. ALI holds the Chair in Sustainable Resources Development at the University of Queensland's Sustainable Minerals Institute (SMI). Established in 2015 – the year the United Nations has committed to launching the Sustainable Development Goals – UQ will use the Chair's mandate to focus research and training efforts towards reaching these goals in the most ecologically and economically efficient way. He is also Affiliate Professor of Politics and International Studies at UQ where he is part of the Conflict. Professor Ali retains an Adjunct Professorship in Environmental Studies at the University of Vermont's Rubenstein School of Natural Resources, where he was the founding director of the Institute for Environmental Diplomacy and Security. His training and teaching at CSRM include modules on mineral economic history and conflict resolution for the Anglo American Advanced Social Management Program held in South Africa and Chile (in partnership with the University of Cambridge, UK).

DR. ILHAN NIAZ is a Professor of History at Quaid-e-Azam University, Islamabad, Pakistan. He is also the author of Old World Empires: Cultures of Power and Governance in Eurasia (New York: Routledge, 2014; South Asia edition by Oxford University Press), The Culture of Power and Governance of Pakistan, 1947-2008 (Karachi: Oxford University Press, 2010, Reprinted: 2011, 2012, 2016), and an Inquiry into the Culture of Power of the Subcontinent. He has written for the leading international academic journals including The Journal of he Royal Asiatic Society, Asian Affairs, The Journal of South Asian and Middle Eastern Studies and many more. His book, Culture of Power and Governance of Pakistan, was awarded the best non-fiction book of 2010 at the 2011 Karachi Literature Festival, and has also received the Higher Education Commission of Pakistan award for best book in social sciences, arts and humanities for 2010. His other book, Old World Empires: Cultures of Power and Governance in Eurasia, also received the HEC award for best book in social sciences for 2013/14. Dr. Niaz is currently working on his next book, to be published by IB Tauris titled, "State and Society in British India: Institutions and the Imperial Legacy in South Asia". Dr. Niaz is also the recipient of the Kodikara Award for 2013, authored a monograph on Understanding and Addressing the Administrative Aspect of the Civil-Military Imbalance in Pakistan.

ASIF IFTIKHAR is currently Visiting Faculty at Lahore University of Management Sciences (LUMS). He did his PhD in Islamic Studies from Institute of Islamic Studies, McGill University, Canada. His dissertation topic relates primarily to study of modern epistemic and hermeneutical challenges to traditionalisms and Islamism in Pakistan; it partly relates to crosscurrents in the development of discourses on Islamic governance and jura belli (Laws of War or Jihad) in Pakistan. His publications exceed 400 pages of articles in various journals. His article, "Murder, Manslaughter, and Terrorism – All in the Name of Allah" (available widely online) was translated into a number of languages, cited in various books and articles, and used in a number of university courses.

POLICY NETWORK

SENATOR MOHSIN LEGHARI attended the University of Oklahoma. After graduation, he obtained a Postgraduate Diploma in Applied Economics from the University of the Punjab. Later, he acquired Certification in Global Financial Markets from the Securities Institute of Australia. He has worked with the world's leading Multinational Financial Information and Information Technology companies before being elected to the Provincial Assembly. After two terms (2002-2007 and 2008-2012) in the Provincial Parliament, he has been elected as an independent senator from Punjab in 2012. During his tenure in the provincial parliament, he was the Chairman of the House Committee on Local Government and Rural Development (2003-2007) and member of the Public Accounts Committee (2008-2012). He is an alumnus of the National Defense University, Islamabad and the Frederich Naumann Foundation's International Academy for Leadership at the Theodor Heuss Academy in Gummersbach, Germany.

DR. MUSADIK MALIK is the Special Assistant to the Prime Minister. Prior to this, he was previously serving as PM's Advisor for Water and Energy. He has extensive international experience in public policy with a focus on economic transformation, industrial development, labour reform, employment generation, education, and healthcare. He has led significant projects in different sectors for the Sultanate of Oman, KSA, Bahrain and Government of Puerto Rico. Until recently, he was the Managing Director of a leading public sector strategy consulting firm. He has served as an advisor to government bodies in North America, Middle East and South Asia. Dr. Malik has previously served as the Vice President and Regional Director for the Middle East for Charles River Associates (CRA International) and also on senior positions at Arthur D. Little (USA) and SRI International (USA). Dr. Malik finished his Post-Doctoral Fellowship at the University of Illinois – College of Medicine in Health Economics and Medical Decision Making. He obtained Ph.D. and M.S. in Healthcare Administration and Policy and an MBA from the University of Illinois. He has taught and supported undergraduate and graduate courses in public policy and management. He has widely presented his policy frameworks and recommendations at international conferences and in front of senate and cabinet members across various countries.

DR. SAMEHA RAHEEL QAZI is a politician who is an active member of Jamaat-e-Islami women wing, elected as member of the National Assembly in 2002. She has a PhD in Islamic Studies and was a staunch opponent of the women rights bill proposed by the Musharraf government. She is a profound writer in various magazines and used to write on topics like Islam, socio-cultural issues, politics etc.

ADVOCATE JAMILA JAHANOOR ASLAM is an advocate of the High Court. She runs a law partnership firm called Jamila Aslam Law Associates. She has a vast and varied experience in the field of Civil, Criminal, Corporate, Family, Labour, Customs, Banking, Revenue, Services and various other laws. She is on the PTCL panel of lawyers and has attended to a number of cases assigned by PTCL at the lower and High Court level. She is Vice President of the Autism Society of Pakistan, an alumnus of the National Defence University by token of the fact that she was a participant of the National Security Workshop 12. She also served as a prosecutor for National Accountability Bureau. She was summoned by the High Court, Toronto as an expert on Muslim Family Law and the decision of the Honourable Court was taken on the basis of her testimony and expert opinion. The judgment propounded on the intricacies of the Sharia law on family matters. She has had the singular honour of having being elevated to the bench of the Lahore High Court as a Justice. During her tenure as Judge of the High Court, she was recommended by the Chief Justice of Pakistan to attend a Training of Trainers, three-week course in Halifax, Ottawa and Toronto in Canada. She also had an appearing before a Field General Court Martial - the first time in the history of Pakistan Army that a female lawyer was given right of audience before a Martial Law Court, and also the first time in the legal history of the country that a DNA was admitted as evidence - which she later won.

AMIR JAHANGIR, a strategic communication and media professional, has been honored as a Young Global Leader by the World Economic Forum for his initiatives to improve the state of media and its co-relation with innovation, economic empowerment and development issues in South Asia. He is Founder and CEO for MISHAL and has launched the flagship program on media development by bringing press clubs & journalist's associations on a common platform to identify gaps in issues impacting the society. He has also worked on the national strategy to engage media to develop policy framework on ethics and its

dissemination at grassroots level. He led the research and is the founder of the Media Credibility Index, to improve narrative building mechanisms through credibility and media ethics. He represents the Center for Global Competitiveness and Benchmarking Networks, World Economic Forum in Pakistan to measure and develop Pakistan's global rankings the various socio-economic and political indicators. He was Advisor to the Stanford Center of Innovation and Communication, Stanford University on Journalism and Media (2009-2010). The Festival of Media 2010, Valencia ranked him among the top 10 media personalities in the world. Jahangir has been the founding CEO for CNBC Pakistan and SAMAA TV. As CEO SAMAA TV, he put forth the concept of developing the proposed National Security Policy through an interactive television program by engaging stakeholders within and outside Pakistan. Jahangir has been part of the launch team of the Competitiveness Support Fund, the first joint initiative of the United States Government and the Government of Pakistan to improve the state of competitiveness. Jahangir was awarded the Global CEO Excellence Award 2011 for Media Development in Pakistan, Innovation in Health Journalism Award by the Government of Pakistan in 2009 and the Health Media Award for Innovation in 2010. He was also bestowed with recognition for being the most innovative strategist for inter-clusters communication between media, communications and various economic growth indicators. He has received multiple awards by various national and international multilateral entities for his contributions for media development in Pakistan including UNICEF, WHO, Ministry of Health, Government of Pakistan. Jahangir is a frequent speaker at academic institutions like Harvard University, Stanford University and academic institutions across Pakistan and various international forums along with the World Bank and various regional and annual meetings arranged by the World Economic Forum from time to time.

SYED ALI RAZA ABIDI is a Pakistani politician, and parliamentarian. He was elected as member of National Assembly on a ticket of Muttahida Qaumi Movement from NA-251 (Karachi) in Pakistani general elections, 2013.

FARZANA YAQOOB represents the next generation of leaders from South Asia. Being a youth leader, social activist & entrepreneur from Azad Jammu & Kashmir, she believes in humanity and striving for justice. She strived to justify her belief after winning the trust of people of Azad Jammu and Kashmir and then serving as Minister for Social Welfare and Women Development in 2011. She is an Eisenhower Fellow. During her Fellowship, she examined conflict resolution and climate change mitigation strategies for Kashmir. In 2015, she launched International Friends of Kashmir at the European Parliament with Member of European Parliament Raja Afzal. She established the first Drug Addicts Rehabilitation Center at Muzaffarabad. In November 2016, she launched the Benazir Bhutto Leadership Programme with the Harvard class of 1973. She is considered to be one of the most thought provoking leaders in the region on issues of conflict, women empowerment and social security networks. She is a frequent team-member at national and international forums. Economic Empowerment of the Women of Kashmir has been one of her core passions; she envisioned and created a special project to launch a special loan scheme for women entrepreneurs. The initiative was launched in collaboration with the Azad Jammu and Kashmir Bank. Through this initiative, initially 24 women were identified and an amount half a million rupees were disbursed. The scheme ensured the entrepreneurs to pay for the principal amount while the interest was paid by the government.

LT GEN (RETD.) NAEEM KHALID LODHI has served as Sectary of Defense for Pakistan. He was commissioned in the Army on 27 October 1974. He has a Bachelors in degree in Engineering (Civil). He is a graduate of Command and Staff College, Quetta and National Defence University, Islamabad and Master in International Relations. He has served on various command, staff and instructional assignments in his career in the Army including the important appointments of Directing Staff at National Defence College (now National Defence University) Islamabad, Commander Corps Engineers, Director General Engineering Directorate, Director General Staff Duties Directorate, General Officer Commanding Bahawalpur, General Headquarters Rawalpindi and Corps Commander Bahawalpur. In recognition of his commendable services, he has been conferred the award of Hilal-e-Imtiaz (Military).

BARRISTER SENATOR NAWABZADA SAIFULLAH MAGSI is a member of the Senate of Pakistan. He was elected as the youngest Senator of Pakistan at the age of 30 in March 2012. He is affiliated with the Pakistan People's Party and hails from an established political background. Senator Magsi went on to pursue a law degree and graduated from the

prestigious University College London with honors. Senator Magsi was called to the Bar from Lincoln's Inn in 2005. He has been involved in politics quite soon after finishing education. He was a member of the Cabinet in the government of Balochistan in 2007 and was Minister for Planning and Development, Law and Justice, Inter-Provincial Coordination and Department of Prosecution. Senator Magsi has also remained a member on the board of the Privatization Commission. He is a member of important Standing Committees of the Senate including Water and Power, Law and Justice, Cabinet Division, Planning and Development and others; and in this capacity, he has furthered causes such as clean and renewable energy, reforming civil services and ensuring primary and essential service delivery by the government and state to its citizens. Senator Magsi was a member of the Law Committee when it passed ground-breaking legislation on rape and honor killing and pushed for its passage through Parliament which was finally done in 2016.

FAWAD CHAUDHRY is a lawyer by profession and politician by passion. He joined the media around three years ago but has emerged as a powerful liberal voice on our television screens. Fawad hosts a prime-time show Khabar Kay Peechay on Neo TV. Chaudhry belongs to a prominent political family of the Punjab – his grandfather and other family members have occupied various important positions in the past. Fawad has been an adviser to the Prime Minister of Pakistan and is now a Spokesperson of the Pakistan Tehreek-e-Insaf (PTI).

SARDAR VICKAS HASAN MOKAL is a Member of the Provincial Assembly of Punjab. He was elected in 2013 general elections from District Kasur. Vickas has a Master's degree in Economics and has an extensive experience in social development sector of Pakistan. His professional experience includes a decade with SMEDA (Small & Medium Enterprise Development Authority, Ministry of Industries & Production). SMEDAs core objective is to provide management assistance and consultancy to SMEs of Pakistan. Vickas has also worked in AHAN (Aik Hunar Aik Nagar) as head of product development and international linkages. AHAN worked with artisans, craftsmen and women across Pakistan and provided them with opportunities to market their products in national and international markets. As Director Marketing for EPE Entrepreneurs, a USAID funded program, it was a continuation of the work being undertaken in collaboration with AHAN and local artisans. Vickas has joined active politics since 2011 and was elected for the first time in 2013 elections from PML. He's held the position of Chairman Youth Caucus Punjab Assembly. Youth Caucus is an advocacy group of 80 plus parliamentarians below the age of 40 from all parties including independents. The main focus of Youth Caucus is to highlight issues pertaining to the youth of Punjab. Furthermore, Vickas is a member of the provincial task force on SDGs. He is passionate about entrepreneurship development among the youth of the country and is a staunch believer of the concept that the youth bulge of coming years could be turned into an opportunity for progress rather than a burden.

IRUM AZEEM FAROOQUE is a Member Provincial Assembly, Sindh and she has played the role of an active legislator in the Assembly and media. She was instrumental in passing the Child Marriage Restraint Act 2013 Bill, and has helped pass various resolutions such as Attack on our Soldiers Northwest by the TTP, Stop the Rise of Street Children in Sindh, Rights of the Home-Based Workers and many more. She has organized pre-budget sessions with the concerned departments for the Party's shadow budget. She is also the President of an NGO, Voice of the Civil Society, which brought together volunteers for welfare and social services. She completed her Bachelors in Political Science from P.E.C.H.S College for Women, Karachi.

BUZAIR MARRI is currently serving as the District Chairman of Kohlu. He has studied from the Beaconhouse School System and the British International School Karachi.

SHAZIA ISMAT ZAIDI is an educationalist, a social entrepreneur and a philanthropist. She has over twenty five years of progressive experience in the education and social sector. Having held senior positions, she has the requisite qualifications in Training, Curriculum Development, Quality Assurance, Monitoring and Evaluation, School Management, Human Resource Development and Teaching. During her academic endeavour she formulated staffing strategies, implementing plans and programs to identify talent within and outside the school for positions of responsibility along with proposing progressive and proactive compensation and benefits programs to provide motivation, incentives and rewards for effective performance. Shazia's vast academic Performa particularly with the Bloomfield Hall Schools has enabled her to critically analyses the policies underlying the design and implementation of national education

plans and programmes in critically assessing gaps in policy design of national curriculum, management capacity and development co-operation. In addition to examining the contextual factors for implications for education, Shazia has developed her worth within the ambit of Security Paradigm in identifying any ongoing development initiatives on the National Security front that may alter political dynamics with regards to maintaining law & order in the country. She is currently the alumni of National Security Workshop at the National Defense University and now working as course coordinator (NSW 12) with all alumni of NSW (AAN). She has also attended the National Media Workshop 4 at the same university. She is currently working as Director and a partner at Bloomfield Hall Schools. She is also a member of the Bloomfield Hall Executive and Academic Board. She has a major contribution in developing course books and curriculum at Bloomfield Hall Publications. She is an expert on setting up new branches and team building. She remained engaged in Teachers/Heads training programs along with leading the quality assurance team for the school. She has been an active participant with vast exposure at national as well as international seminars, conferences and training workshops. She is also the founder of Crescent Lions Club Islamabad where she served as the President. Due to the immense success of the club she was also elected as zonal head of Lions Club International. She is a member of the executive committee of SOS Village Multan and founding member of the SOS School in Multan. She is the trustee and Secretary General of Mausikaar Welfare Trust (an organization working to preserve and promote heritage music along with the welfare of the artists). Shazia also advises the Asia Institute of Public Policy as their Director Knowledge Development, to promote education collaboration in the Asia region. Shazia has recently completed her Master's Degree in International Relations from Quaid-i-Azam University Islamabad. In addition to these leadership roles, Shazia is called on to speak around the globe on topics critical to issues of education, media and economic development on social sector. In regards to that, Shazia has been part of INSEAD's training in Singapore along with her presence in the LET conference in Vienna, Austria. In May 2017, she has been selected as Country Capital Chair of the 'Global Dignity', an initiative started by the Crown Prince of Norway to promote the value of education and dignity around the globe.

SHAHZAD NAWAZ is a Pakistani filmmaker, actor, singer, advertiser and graphic designer who started his career as an advisor to many news agencies and media publications such as Geo TV, Pakistan Television Corporation, ARY, Dunya News and Jang Group of Newspapers. He also served as CEO of Nai Baat Media Network for a year. He has worked as a graphic designer for a number of organizations - designing their logos - including of Pakistan Television Corporation. Mr. Nawaz's claim to fame came with the film Chambaili that he wrote and produced, which was the first political film of the country, earning him critical appraisal and a nomination of the ARY Film Award for Best Film as a producer.

LT GEN (RETD.) AGHA FAROOQ is a security, military and public diplomacy practitioner with sharp focus on contemporary conflict dynamics including social, public, societal and ideological behaviors affecting national, regional as well as international peace, conflict and stability. He is a graduate of Command & Staff College Quetta, National Defence University Islamabad, and US Army War College Pennsylvania, USA. He holds two Master's degrees; a Master's in Strategic Studies and another in War and Defence Studies. His special assignments in the past include: President National Defence University Pakistan, Senior Consultant United Nations Office for Drug and Crime in Pakistan, Member Higher Education Commission of Pakistan, Member technical committee National Action Plan Committee for Counter Terrorism, India-Pakistan Mil to Mil track 2 dialogue, US-Pakistan Strategic Dialogue, Senior Vice President – Centre for Pakistan & Gulf Studies, Chief of Staff and Operations for Federal Relief Commission for Earthquake October 2005, Director General Earthquake Reconstruction & Rehabilitation Authority, Prime Minister Secretariat. His areas of interests and contributions are: international relations, comprehensive national security and policy, public and military diplomacy, developing strategic leadership and skill-based education programmes, skill-competency based quality education systems, strategic leadership and management, country risk and need analysis, perception management & perceptual mapping, project and programs development, counter-terrorism & counter-insurgency, soft power and hard power dynamics, disaster Response, crisis management and contingency planning.

NATIONWIDE CONTRIBUTION FOR THE INAUGURAL REPORT OF THE PAKISTAN STATE OF FUTURE INDEX

The Foresight Lab Team greatly appreciates the insights, reviews and comments received from the participants. We would like to thank each one for their time and their invaluable contribution:

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