Final report

A framework for development of Balochistan spatial strategy

IGC

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Growth Centre

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A Framework for Development of Balochistan Spatial Strategy

Contents

List of Acronyms

ADP	Annual Development Plan
BCDS	Balochistan Comprehensive Development Strategy
BSS	Balochistan Spatial Strategy
BOS	Bureau of Statistics
CDWP	Central Development Working Party
CPEC	China-Pakistan Economic Corridor
CNTDP	Comprehensive National Territorial and Development Plan
DSS	Decision Support System
DDWP	Departmental Development Working Party
DEM	Digital Evaluation Model
DDWP	District Development working Party
EPA	Environmental Protection Agency
FDI	Foreign Direct Investment
GIS	Geographic Information System
GoB	Government of Balochistan
LG&RD	Local Government and Rural Development
MIS	Management Information System
NFC	National Finance Commission
NHA	National Highway Authority
P&D	Planning & Development
P&DD	Planning & Development Department
PMU	Project Management Unit
PDWP	Provincial Development Working Party
RDA	Regional Development Authority
SOP	Standard Operating Procedure

Executive Summary

Context

Balochistan is Pakistan's largest province by area but least inhabited in terms of population. It is endowed with abundant natural resources including land, fossil fuels (oil and gas), minerals (copper and gold), an expansive coast and rangeland for livestock purposes. Of all the provinces, Balochistan is the largest supplier of natural gas in Pakistan. Two-thirds of the country's coastline is along its southern border. It sits at the intersection of key regional trade routes and corridors and has a very strategic location. Yet, despite its location and resources, it remains Pakistan's poorest and most underdeveloped regions and its tremendous potential has not been realised. Of the five poorest districts across Pakistan, four are in Balochistan.

An array of conflicts – tribal, sectarian, and ethnonationalist – have also emerged in the last two decades, plunging parts of the province into sustained instability. Compounding these issues is the province's severely underdeveloped socio-economic base, as it continues to lag on all indicators of human capital and economic investment. To add to this, the low population density has both increased the per unit cost of service delivery and the difficulty in providing basic public services across all settlements.

The low population of the province scattered over a vast territory as well as inequitable resource distribution over the last many years has resulted in uneven development in the province. Inequitable distribution of scarce financial resources has also created issues of regional inequality within the province and caused an influx of migration towards the only major city in the province i.e. Quetta, leading to rapid and unsustainable urbanization.

Without a guiding framework, public spending in Balochistan remains ad-hoc, discrete, inefficient and weakly aligned with actual development needs of the province. This calls for adopting a spatial approach towards Balochistan's future development that links investments with territorial/spatial realities. Development decisions that come from a system based on a spatial strategy are inclined to be more inclusive and focused on integrated solutions, unlike what is achieved in a sectoral or departmental decision-making process. Often outcomes in one department or sector are linked to or are the result of investments in another sector. This kind of analytical thinking and ability to create linkages is not possible in the absence of an integrated Spatial Strategy.

Why does Balochistan need a new framework for development?

These constraints have been made worse in the absence of a well thought-out long and medium-term strategic planning framework to guide public investment and policymaking. The last detailed economic report for the province was prepared in 2008, as a joint effort by the World Bank, Asian Development Bank and the Government of Balochistan (GoB). This was followed by a Comprehensive Development Strategy (2013-20) by the GoB with support from UNDP. While comprehensive in its coverage of issues, these reports were not accompanied by any time-bound spatial plans to help departments implement programs and have thus played a limited role in linking public investments to development needs of the province. Many of these reports lacked a consultative approach and hence there was little policy traction

or ownership of the recommendations put forth by these reports. These reports also did not present an institutional framework for their execution or effective implementation.

Moreover, the strategic vision offered by the recent studies need to be revisited in the light of three recent major national developments: (i) the 18th amendment to the constitution in 2010 that delegates financial and administrative autonomy to provinces and has created increased fiscal space for the provinces, (ii) the roll out of the Benazir Income Support program to strengthen country-wide social protection and its scaling up via the Pakistan Tehreek-i-Insaf's Ehsaas program, and (iii) the launch of the China-Pakistan Economic Corridor (CPEC) as a framework of regional connectivity that creates potential for increased investment in the province, including the development of Gwadar as a port city.

In Balochistan, the absence of a spatially anchored strategic planning framework to guide public investment and policymaking has been a key constraint for growth. Public investments, especially in infrastructure, are typically made without consideration of locational advantages, existing clusters, or human settlement patterns. Often investment decisions are solution- rather than problem-driven as various government departments plan their facilities in isolation. This subjective as opposed to a data-driven approach towards decision making has become a key hurdle in responsive and relevant development planning. All of these factors highlight the need for a long-term development strategy that takes into account recent developments and is underpinned by a spatial framework that responds to Balochistan's needs and strengths to guide provincial budgetary allocations.

The province's Planning and Development (P&D) Department, the central planning authority, can use the a spatial strategy as a means to: a) Utilise the increased fiscal space available to the province after the 7th National Finance Commission (NFC) award[1]; b) Harness the potential of the opportunities presented by the China-Pakistan Economic Corridor (CPEC)[2] and other expected Foreign Direct Investments; c) Realize the true growth potential of the province and enable it to catch up with other provinces in terms of growth and socio-economic development.

How will a Spatial Strategy help Balochistan?

Many countries have developed spatial strategies, plans and development frameworks for both developing and developed regions to boost **public investment efficiency, urban growth** and **economic development**. These strategies spur growth and competitiveness by enabling better transnational and regional connections, optimizing existing infrastructure, reducing peripherality and serving regional balancing imperatives. Unlike mainstream development planning, spatial planning can provide a framework to rationalize and sequence public investments targeted at optimum efficiency and investment gains by **linking current plans and policies to territorial realities.**

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[1] In the 7th NFC Award share of provinces in the divisible pool increased from 49% to 56% during 2010-11 and 57.5% during the remaining years of the Award. The traditional population-based criteria for horizontal distribution of resources amongst the provinces was changed to a Multiple-Criteria Formula. According to this criterion, 82% distribution was made on population, 10.3% on poverty and backwardness, 5% revenue collection/generation, and 2.7% on inverse population density (IPD).

[2] China–Pakistan Economic Corridor (CPEC) is a collection of infrastructure projects that are under construction throughout Pakistan since 2013. Originally valued at $46 billion, the value of CPEC projects is worth $87 billion as of 2020. Around 20% of CPEC is debt-based finance, while 80% are investments in Joint Ventures enterprise between Pakistan and China.

1. Any well-developed spatial strategy when executed will ground policy objectives within the space it will ultimately be implemented in. In the case of Balochistan, a spatial approach can be especially useful for maximizing the development gains now possible with greater fiscal space following the 7th National Finance Commission (NFC) Award and for capitalizing on the opportunities presented by the China-Pakistan Economic Corridor (CPEC), and other expected Foreign Direct Investment (FDI) windows.

2. A spatial strategy for Balochistan can provide policymakers with information and tools through an organizing framework for long-term development planning as opposed to short-term yearly budget planning. For example, the strategy can help plan investments around large infrastructure projects that fall under CPEC.

3. By developing a Spatial Strategy, GoB can guide its development priorities and maximize the efficiency of its natural, human, and capital resources towards overall development of the province. The Balochistan Spatial Strategy (BSS) can
   a. Help identify and analyze existing settlement patterns, state of infrastructure and service provision,
   b. Assess the economic potential of each district/region,
   c. Identify potential growth nodes based on comparative advantages (economic, locational advantages, human development), and
   d. Prioritize and sequence spatially optimal strategic interventions that may help realize the growth potential of each region. Such a strategy can inform public investments related to connectivity infrastructure, urbanization and development of industrial zones, schools, hospitals, and other facilities, making these investment decisions in an objective, efficient, and economic manner.

4. As an organizing framework, the BSS can also provide a reflection of past and current trends and identify sectoral and inter-sectoral functional relationships throughout the province.
   a. This will provide the basis for objective decision-making, not only for prioritizing new infrastructure, but also for maintaining existing facilities.
   b. It will help in categorizing diversity and specific needs of different communities within the plan area in terms of sector or themes (e.g. infrastructure, transportation, economic or environmental projects).

5. Such a strategy can be supported by a good Decision Support System (DSS) which can build upon province-wide data to not only assist the provincial government, but also local governments in project identification and need-based planning, as these entities typically lack in-house technical capacity to undertake projects on their own.

Pillars of a good spatial strategy

A good spatial strategy helps to create a collective vision for growth, manage spatial change, and meet strategic economic, social, and environmental objectives. Unlike strategic plans without a spatial focus, strategic *spatial* planning makes clear the connection between policy and territorial reality.

Regional spatial strategies provide a long-term vision and framework for integrated spatial development. In the case of Balochistan, such a strategy can start with a broad provincial vision for development, followed by local (City, District, Division) spatial plans that encompass a comprehensive

infrastructure and socio-economic development strategy and a broad plan, aligned with the local needs and aspirations. These strategies and plans can serve as building blocks for a provincial level spatial strategy.

A spatial planning approach permits simplicity and efficiency in public investment decisions, looking at regional needs in an integrated manner, rather than the current sectoral approach towards formulation of the Annual Development Plan.

A good spatial strategy employs a bottom-up approach and identifies comparative advantages (economic potential, locational advantages, human development level) for each region. It subsequently conducts value-chain-analyses to determine the optimal match between sectoral investments and regions.

Unlike traditional spatial planning, strategic spatial planning focuses on action and implementation mechanisms, and includes various short, medium and long-term programs of action that are matched by requisite resource allocation and provide a framework for rationalizing and sequencing public investments to maximize efficiency and investment gains.[3]

Key Components of the Balochistan Spatial Strategy

Data Development Framework

The basic foundation on which the BSS will be built upon is an extensive, comprehensive and well-planned data inventory. This will include both spatial (imageries, maps and map-related) as well as non-spatial (alpha numeric and text) data across all departments, sectors and districts. The use and creation of this data inventory will be guided by a ***Data Development Framework*** to govern data acquisition, data storage, data visualization, data sharing and data analytics so that robust and purpose-oriented reports can be generated which will useful for strategy development.

Typically, spatial analysis starts with a base map, or layer, upon which multiple other layers are applied. For BSS, this base layer can be the borders of the Balochistan province, on top of which layers showing administrative boundaries at the district, tehsil, and where possible, *mauza* level, can be applied. Visualizing data points such as population, income, housing stock, connectivity, industrial and agricultural growth, and the spread of public services such as health and education can allow policymakers and planners to effectively gauge how the region is evolving, what is holding back economic and social development, and how future changes might affect inhabitants.

It is unlikely that much of this data will be readily available, especially in the form of spatial datasets. Most of this data will have to be collected or generated. The tools available to do this include primary and secondary data collection, image processing, remote sensing, the use of Big Data such as that generated by cellphone usage, and geographic information system (GIS) based digitization to demarcate tehsil and mauza boundaries.

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[3] For further details on strategic spatial planning processes see: Albrechts, L. 2017. 'Strategic Planning.' In M. Gunder, A. Madanipour, V. Watson (Eds*), The Routledge Handbook of Planning Theory*.

Data collection is also a costly process. An important caveat that must be kept in mind while collecting the data and developing the strategy is that the benefits of more data do not always outweigh the costs. As such, all efforts at data collection must be guided by specific policy questions and must be supported throughout by stakeholder buy-in.

Decision Support System

A second key element to support and supplement data collection and analytics, will be an IT-based *Decision Support System* to make use of this data, with the objective of supporting evidence-based and responsive decision making. On several occasions even when data is available with departments, it may not be easily accessible to the decision-making forum at the time of decision-making, hence the need for an underlying Decision Support system is also critical. This can provide real-time integrated data for multiple sectors. For example, low enrollment rate in many tehsils is not due to lack of school facilities, but for frequent incidence of diarrheal diseases, that causes dropouts. Thus, a decision to construct more schools based on low literacy rate would be futile.

Integrated data sets would improve decisions regarding future investments in developments schemes. An advanced level of DSS, in addition to the provision of real time data, can also help in predictive and prescriptive data analytics by building scenarios, providing options and sensitivity analyses, and guide decision-making towards an optimum investment decision.

Baseline and Vision

- **Baseline Report: Balochistan 2022 (A data and maps compilation of all sectors of the province):** This would provide a baseline of the province, both as maps, as well as numbers.
- **Vision 2047 (can be developed for 25 years, 2022 – 2047):** Via a thoroughly consultative process, the development team can chalk out a vision for the future of province. A suggested timeline is 25 years, to coincide with the 100th birthday of Pakistan.

Key Strategic Objectives

Using the baseline and vision 2047, the GoB can develop a core strategy which will include specific pillars upon which the strategic direction can be set to guide various investments in the next couple of years. These pillars can take into account development principles, available resources while setting ambitious targets around

a) Growth, job creation and investment
b) Investment in human capital
c) Targeting for social protection and poverty reduction

Key Sector Coverage

In addition to the core provincial strategy, there can be a number of sectoral strategies, for example for transport and connectivity, urban development, industrial development, agricultural development etc. A total of 17 sectors have been prioritized for the BSS, in line with the Comprehensive Development Strategy 2013-20.

- o Improvements in transport and connectivity are critical components of any spatial strategy. The BCDS 2013-20 primarily focuses on road infrastructure, particularly as most infrastructure is in dire need of repairs, however, for long-term sustainability and growth, the scope of transport policies needs to be considerably widened to include other forms of transport infrastructure and mobility requirements as well and include a rural focus.
- o Improvements in access to health and education is integral for human development and long-term prosperity. The BCDS 2013-20 does not make use of spatial analysis to identify regional disparities in health and education. For Balochistan, just like in Punjab, the spatial strategy can use an educational composite index and a health dimension index to spatially rank districts to identify areas most in need of investment and form the basis of health and education sectoral strategies.
- o Planning for urban development is key for long-term economic, social, and environmental sustainability. The sectoral strategy should incorporate lessons from the evaluation and support integrated sustainable urban development by bringing together key stakeholders, earmarking finances for implementation of the strategy, and delineating appropriate institutional mechanisms and capacity-building measures.

The final strategy will entail the following segments:

Implementation

The BSS will entail roles and responsibilities for provincial line departments, local governments, development authorities, industrial estate management entities as well as private sector stakeholders. These roles range from policymaking, funding, planning and development, regulation collection of user-fees, among others. These stakeholders will need to be engaged as part of an institutional structure that includes the following units/bodies:

- A Spatial Planning Board/Council to provide policy guidance and oversight, headed by the Chief Minister, GoB with members drawn from legislature, academia and think-tanks
- A Spatial Planning Authority to serve as the main implementation hub for the BSS to be headed by the Additional Chief Secretary (Planning) supported by a Project Management Unit housed within the P&D Department
- A Project Management Unit (PMU) within Planning & Development Department (P&DD) to coordinate actions, gather data, drive progress and solve problems
- Dedicated Units within Priority Departments and Divisions to implement actions contained in the BSS with the support of PMU
- A Spatial Development Fund may be considered provided there are some clearly identified funding sources.

The BSS will need to be integrated with the mainstream development planning cycle, including the processes in place for: a) Project Identification and Formulation; b) Project Appraisal; c) Project Monitoring & Evaluation. Moreover, the institutional architecture of BSS should be provided legal cover through a law, as in Germany, Korea and Malaysia to strengthen its sustainability and aid in implementation.

In terms of initial steps, the GoB may move to set up the institutional architecture for the BSS to drive the process forward. This will begin with the development of a development of a PC-I[4] to find resources to provide the human and physical resources to set up the PMU and engage consultants for strategy development and review. In the interim, the Spatial Planning Board/Council may be constituted through a formal notification by the GoB. Under the guidance of the Spatial Planning Board, the PMU will:

1. Prepare the Data Development Framework
2. Map and collect secondary data
3. Collect primary data
4. Conduct a Spatial SWOT analysis based on available data
5. Develop Spatial Vision and Objectives
6. Develop the Core Strategy and Sectoral Strategies
7. Localize Spatial Planning at the Division, District or City Levels

These steps will be run in parallel with province-wide efforts to raise awareness with spatial planning concepts and tools, build stakeholder buy-in, enhance the capacity of practitioners, and deploy change management strategies.

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[4] Preliminary documentation for development projects to be submitted to the Planning & Development Department.

1 Introduction

1.1 Context and objective

The Government of Balochistan aims to develop a Spatial Development Strategy to guide its development priorities and to maximize the efficiency of its natural, human, and capital resources towards the overall development of the province. The development and use of Balochistan Spatial Strategy to support economic growth and investment decisions is a key priority for the Government of Balochistan. To this end, various multilateral institutions such as the World Bank or the United Nations Development Program (UNDP) could be approached to provide technical and financial support for the development of the strategy. However, it is critical at the outset to develop a framework to identify the purpose of such a spatial strategy, its key function and expected role in the overall decision-making machinery of the province. To this end, this document will lay down the contours of such a spatial strategy by

a)   Identifying the spatial implications of Balochistan's growth and development strategy based on recent analytical work
b)   Outlining the contours of a spatial strategy corresponding to Balochistan's needs including data requirements.
c)   Developing terms of reference for a comprehensive spatial strategy for Balochistan that incorporates recent national developments/opportunities, identifies provincial growth nodes that complement Quetta for a more regionally balanced growth and an investment program to support the strategy exploring the role of technology/ GIS-based decisions.

Balochistan is endowed with abundant natural resources including land, fossil fuels such as oil and gas, minerals, an expansive coast, and rangeland for livestock purposes. Furthermore, the province also has a very important strategic location and sits at the intersection of key trade routes and corridors. However, the tremendous potential of the province has not been realized, owing to multiple factors. One of the biggest constraints in the development of Balochistan is its extremely low population that is scattered over a vast territory. This low population density has not only increased the per unit cost of service delivery, but also made it extremely difficult to provide basic public services across villages and settlements.

This has also resulted in an inequitable distribution of scarce financial resources, creating issues of regional inequality within the province, which in turn has caused an influx of migration towards the only major city in the province i.e. Quetta, creating issues of unsustainable urbanization in Quetta.

There are also several challenges in public sector planning within the province. A significant number of development schemes in the Annual Development Plan (ADP)[5] are sponsored by local politicians, and hence reflect their local interests, as opposed to objective data driven analyses and long-term strategic plans. Many social sector facilities like schools, hospitals and Basic Health Units (BHUs) etc. are planned with little field data available, and thus their utility remains sub-optimal. As a result, a province which is

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[5] The Annual Development Plan is a key policy instrument used to provide a strategic roadmap for the growth and development of a province and achieve the development targets set forth by the Federal and Provincial governments.

already lacking in quality infrastructure and services, ends up wasting much of its meagre development resources due to inefficient planning.

Balochistan also lacks an integrated spatial strategy that can guide or support planning towards integrated development. Often infrastructure development is not problem oriented, rather it is solution driven as departments plan their facilities in isolation. This subjective as opposed to data driven approach towards planning and decision-making remains a key hurdle in quick and responsive development planning. Even when data is available it may not be easily accessible to the decision-making forum at the time of decision-making, hence the need for a Spatial Strategy underpinned by an integrated Decision Support System is critical.

The Balochistan Spatial Strategy (BSS) will identify and analyze existing settlement patterns, state of infrastructure and service provision, assess the economic potential of each district/region, identify potential growth nodes based on comparative advantages (economic, locational advantages, human development), and prioritize and sequence spatially optimal strategic interventions that may help realize the growth potential of each region. This strategy will inform public investments related to connectivity infrastructure, urbanization and the development of industrial zones, schools, hospitals, and other facilities, making these investment decisions in an objective, efficient, and economic manner.

The province's Planning and Development (P&D) Department, the central planning authority, can use the such a development framework as a means to: a) Utilise the increased fiscal space available to the province after the 7th National Finance Commission (NFC) award[6]; b) Harness the potential of the opportunities presented by the China-Pakistan Economic Corridor (CPEC)[7] and other expected Foreign Direct Investments; c) Realize the true growth potential of the province and enable it to catch up with other provinces in terms of growth and socio-economic development.

1.2 Why does Balochistan need a new development framework?

1.2.1 Current challenges

Extensive engagement with Balochistan's P&D Department and its various sub-departments and units revealed a number of development planning challenges that earlier planning and vision documents were unable to address:

1. Low population density and uneven spatial distribution has led to high per unit cost of service delivery and inadequate basic service provision across settlements;
2. Lack of evidence on the comparative advantages (economic, locational, infrastructure) of each region within Balochistan prevents policymakers from identifying public investment priorities in each region;

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[6] In the 7th NFC Award share of provinces in the divisible pool increased from 49% to 56% during 2010-11 and 57.5% during the remaining years of the Award. The traditional population-based criteria for horizontal distribution of resources amongst the provinces was changed to a Multiple-Criteria Formula. According to this criterion, 82% distribution was made on population, 10.3% on poverty and backwardness, 5% revenue collection/generation, and 2.7% on inverse population density (IPD).

[7] China–Pakistan Economic Corridor (CPEC) is a collection of infrastructure projects that are under construction throughout Pakistan since 2013. Originally valued at $46 billion, the value of CPEC projects is worth $87 billion as of 2020. Around 20% of CPEC is debt-based finance, while 80% are investments in Joint Ventures enterprise between Pakistan and China.

3. Limited data availability, analysis and evidence-based decision-making has resulted in ad-hoc, politically driven investment decisions and wastage of limited resources;
4. Regional inequality and inequitable distribution of financial resources has led to uneven development across the province;
5. There is a lack of data/evidence-based tools to screen and assess development proposals, especially to gauge site selection and the likely impact of the scheme on socio-economic development;
6. Uneven development has led to unplanned and unsustainable urban development, particularly in the regional capital Quetta;
7. Development planning has been hindered by a lack of integrated strategic spatial planning to guide investment and policymaking;
8. Policy and administrative discontinuity have led to short-term planning and project implementation cycles;
9. Absence of spatial frameworks to assess challenges and opportunities presented by CPEC and other Foreign Direct Investments (FDIs) has created difficultly in prioritising infrastructure investments.

Through the collection and analysis of spatial and non-spatial data, the Balochistan Spatial Strategy can allow the province to geographically analyse population densities and the state of development across the province. It can enable it to identify the potential of each region, assess opportunities and challenges, plan ahead, and devise growth ambitions and future priorities. The analysis can also help guide public investment and prioritize investments in marginalized locations. Further, it will help identify growth nodes and corridors (particularly in relation to CPEC investments) through a data-driven approach. Additionally, the BSS can be used to develop sectoral objectives and priorities for key sectors such as transport and connectivity, urban development, health and education etc.

1.2.2 What was lacking in previous reports and strategies?

Over the past two decades, a number of reports and strategies have been prepared to guide planning and development in Balochistan. However, in many instances, these endeavours have been ineffective. There are several reasons for this.

1. First, it has not been uncommon for such strategies and reports to be developed entirely by consultants without active involvement of government officials and key public-sector stakeholders. As a result, there has been limited awareness and ownership by the government.
2. Second, and relatedly, frequently such strategies have not been approved and hence implemented.
3. Third, such documents have not always proved reliable in terms of data, nor focus on spatial analysis.
4. Finally, they have paid insufficient attention to institutional frameworks for implementation and continuity in the medium to long term.
5. Previous policies do not make any use of spatial analysis to identify regional disparities in health, education and urban infrastructure.

In light of these shortcomings, the BSS can serve as a binding long-term strategic planning framework for the province. The BSS will employ a 'bottom-up approach' for design, planning and implementation purposes. The spatial strategy will be developed through a collaborative approach between city, district,

and provincial government entities. After an assessment of the potential of each district/region, each district/city will develop its own strategy (with short, medium, and long-term targets) in line with overall provincial ambitions and objectives.

Key decisionmakers in the provincial government will be consulted and involved from the start, and the institutional architecture for the BSS will be developed as per the GoB's requirements. To ensure continuity and implementation, efforts will be made to ensure that the BSS is backed by a statutory framework (see section 6.2). Detailed mechanisms will also be developed to assess progress on a regular basis.

Alongside this, an IT based Decision Support Systems (DSS) can also be developed to help screen, vet and compare development proposals. In this way, the BSS and DSS can help address the planning and development challenges faced by the GoB. Effectively, the BSS can be used by the provincial government to develop and achieve its vision for growth.

1.3   Defining a good spatial strategy

1.3.1   Foundations of a spatial strategy

Spatial strategies are used by cities and regions to create a collective vision for growth, manage spatial change, and meet strategic economic, social, and environmental objectives. There are several benefits to a spatial planning approach that can improve the prospects for more efficient public sector investment, urban growth and economic development in the province.

Regional spatial strategies provide a long-term vision and framework for integrated spatial development. In the case of Balochistan, such a strategy can start with a broad provincial vision for development, followed by local (city, district, division) spatial plans that encompass a comprehensive infrastructure and socio-economic development strategy and a broad plan, aligned with the local needs and aspirations. These strategies and plans can serve as building blocks for a provincial level spatial strategy. They can provide guidance for planning, coordination and investment, help assess current conditions while shaping future growth patterns by developing a platform that allows policymakers to assess existing conditions, opportunities, and costs more accurately and to plan investments accordingly.

A spatial planning approach also permits simplicity and efficiency in public investment decisions, looking at regional needs in an integrated manner, rather than the current sectoral approach towards formulation of the Annual Development Plans. Moreover, decisions about large infrastructure projects can be more easily assessed and sequenced compared to short-term one-year budget planning.

A good spatial strategy employs a bottom-up approach and identifies comparative advantages (economic potential, locational advantages, human development level) for each region and subsequently conducts value-chain-analyses to determine the optimal match between sectoral investments and regions. In particular such a process can support the GoB in identification and investment prioritization of potential growth nodes, especially human settlements, based on parameters of comparative advantages.

Unlike traditional spatial planning, strategic spatial planning focuses on action and implementation mechanisms, and includes various short, medium and long-term programs of action that are matched

by requisite resource allocation, and provide a framework for rationalizing and sequencing public investments to maximize efficiency and investment gains.[8] Spatial strategies can be developed and implemented in four distinct stages: diagnosis, planning, strategic management, and monitoring and evaluation.[9] A good strategy with a sound implementation can help in achieving the true development potential of the Balochistan, in the medium to long term, while improving investment outcomes in the short term.

To summarize, regional spatial strategies provide a long-term vision and framework for integrated spatial development to meet strategic economic, social, and environmental objectives and strategies are used to develop growth policies and sectoral objectives, the implementation of which is carried out in collaboration with local authorities at the city/district level through strategies, plans, programs and partnerships.

1.3.2   Linking spatial planning to economic growth

Spatial strategies are used to harness the economic potential of a region, support equitable and inclusive development, and promote economic efficiency and competitiveness. From a growth perspective, spatial strategies should have the following goals[10]: they should a) optimize the capacity of existing infrastructure and establishing more effective inter-modal linkages; b) Improve transnational and regional connections and collaborations; c) Reduce peripherality and spreading economic benefits more equitably; d) Improve competitiveness generally; e) Promote polycentricity and creating more 'balanced communities'; f) Maximize the benefits of information and communications technology and reduce energy use, pollution, and the need to travel.

Spatial strategies typically provide direction for growth along four inter-connected axes: (1) an infrastructure axis, focusing on transportation and logistics, 2) an economic development axis, with an emphasis on infrastructure and economic development, 3) an urbanization axis, offering guidance for urban development, 4) the institutional axis, focusing on institutional arrangements and issues of capacity.[11]

Well-designed spatial strategies can serve as a critical tool to optimize resource use, guide investment, plan for, and build infrastructure that is required to support economic development, help manage growth over the long-run, and address inequities in development. Unlike strategic plans without a spatial focus, strategic *spatial* planning makes clear 'the connection between policy and territorial reality,'[12] grounds

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[8] For further details on strategic spatial planning processes see: Albrechts, L. 2017. 'Strategic Planning.' In M. Gunder, A. Madanipour, V. Watson (Eds*), The Routledge Handbook of Planning Theory*.

[9] See: United Cities and Local Governments (UCLG). 'Policy Paper on Strategic Urban Development'. Commission on Urban Strategic Planning, https://www.uclg.org/sites/default/files/EN_525_draftpolicypapermonica2504.pdf

[10] As specified by Chapman, D. et al. 2003. 'Concepts and definitions of corridors: Evidence from England's Midlands,' *Journal of Transport Geography*, 11, p.186. The complete list of seven goals for integrative zone-based spatial development also includes protection of environmental and cultural assets and distinctiveness.

[11] Kalliomaki, H. 2012. 'Towards Comprehensive Spatial Development in Europe: A Critical View from Finland.' *Planning Theory & Practice*, 13:4, p.575

[12] Spaliviero, M. et al. 2019. 'The Spatial Development Framework to facilitate urban management in countries with weak planning systems.' International Planning Studies, 24: 3-4, p.236

policy objectives within space, and aids key stakeholders in implementing economic, social and environmental objectives.

At the diagnosis and planning stages (see section 1.2), spatial analysis helps to assess existing infrastructure capacity, and identify areas and sectors that require investment to support future growth needs. Typically, a distinct planning framework/sectoral strategy is then prepared for each sector that brings together key stakeholders and focuses on the steps required to deliver the requisite investment and development. This includes both physical and social infrastructure that is required to support growth objectives. It also entails planning for employment and industrial growth in the locations that will support economic and social development goals sustainably. As shown in Figure 1, spatial development frameworks are also used to identify economic development areas, development corridors, nodal towns.
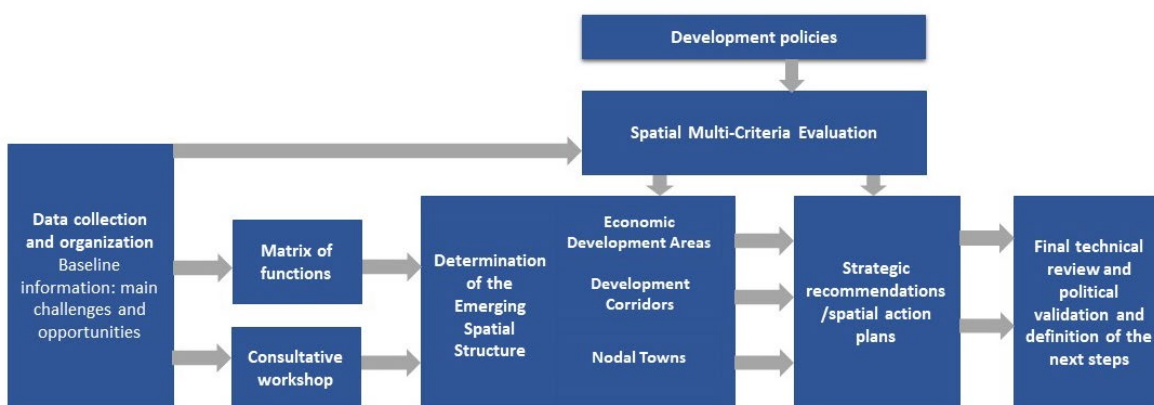
Figure 1: Spatial Development Framework Method, source: Spaliviero, M. et al. 2019 p.241

In Balochistan, the absence of a well thought-out long and medium-term strategic planning framework to guide public investment and policymaking has been a key constraint for growth. The absence of such a framework has led to a public investment system that is ad-hoc, discrete, inefficient and weakly aligned with actual development needs of the province. Public investments, especially in infrastructure, made without consideration of locational advantages, existing clusters or human settlement patterns. It has also led to inequitable distribution of scare financial resources, creating issues of regional inequality within the province.

Spatial development frameworks can hence help support 'decision making by setting out a spatial vision and strategy to a given region with a view to maximizing the benefits from investments and bringing more spatially balanced (in terms of optimal location) and efficient regional development patterns.'[13]

To have impact, however, such frameworks also need to be closely tied to land-use planning practices and infrastructure development plans at the city and district level (see Box 1). Evidence suggests that without such coordination and linkages, they will have limited success in achieving their objectives and guiding

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[13] Ibid, p.240

growth.[14] Integration across administrative units hence is key to successfully meet regional growth objectives. Likewise, it is equally important to ensure coordination with national policies.

Box 1: Spatial frameworks and growth management strategies: the case of Johannesburg

In Johannesburg, South Africa, the planning department developed a Growth Management Strategy (GMS) that linked spatial development planning with infrastructure development. Previously, spatial plans and frameworks offered guidelines for infrastructure development, however, there were no mechanisms in place to connect the two. As a result, infrastructure such as water, electricity, transport was provided independently from the city's spatial plans.

The GMS was developed after several consultations with key stakeholders in the city. The GMS specified priority areas, consolidation areas and extension areas in the city. The strategy itself was linked to the municipality's capital budget. Annually, after a three-month negotiation within the municipality, departments bid for projects which were then assessed as per the GMS through a GIS-based Capital Investment Management System. The GIS system was housed within the development planning and urban management department, and the results were given to politicians to make final decisions.

A two-year assessment of municipal investment suggested that a majority of new capital project investments were made as per the GMS. At the time of assessment, many of the new investments were concentrated around key nodes and corridors, however, several GMS goals such as creating sustainable housing environments, providing affordable housing had variable results. Evaluations over a longer period of time will provide further details on the impact of the GMS. Yet, initial assessments suggest that a framework of this sort has potential to drive growth in an integrated manner.

Source: Todes, A. 2012.

In sum, regional spatial strategies can help governments fulfil objectives for economic growth by identifying opportunity areas, planning for infrastructure needs, improving connectivity (locally and globally), facilitating economic activity, helping create employment opportunities, tackling barriers to growth, and promoting spatial equity and inclusive growth through investments in marginalized areas. For long-term sustainability, however, spatial strategies need to give equal weightage to economic, social and environmental objectives. Further, public consultation should be an integral component of developing spatial frameworks and strategies (see section 2.4). Growth should first and foremost benefit the local population and aim to address historic inequities in development.

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[14] Ibid & Todes, A. 2012. 'Urban growth and strategic spatial planning in Johannesburg, South Africa'. *Cities*, Special Section: Urban Planning in Africa (pp. 155-191), 29 (3): 158-165. https://doi.org/10.1016/j.cities.2011.08.004

1.4 How can a Spatial Strategy Framework be useful for Balochistan?

Spatial strategies are developed in collaboration with relevant departments and stakeholders and are used as a 're-envisioning' exercise to determine 'priorities for area investment, conservation measures, strategic infrastructure investments and principles of land use regulation.'[15]

In the case of Balochistan, the BSS will provide an ***organizing framework*** for long term development planning across the province. An appropriate spatial strategy based on rich spatial and non-spatial data will provide a reflection of past and current trends and identify sectoral and inter-sectoral functional relationships throughout the province. For example, it can identify existing functional relationships between places, document existing population, facilities and needs and broadly estimate the type, size and scope of future needs. This can provide the basis for objective decision-making, not only for prioritizing new infrastructure, but also for maintaining existing facilities. It can help in categorizing diversity and specific needs of different communities within the plan area in terms of sector or themes (e.g. infrastructure, transportation, economic or environmental projects).

To support a spatial strategy, a province-wide data set and an IT based ***decision support system*** (DSS) can also be useful to not only assist the provincial government, but also the local governments in project identification and need-based planning, as these entities typically lack in-house technical capacity to undertake such projects on their own. Development decisions resulting from a DSS based on spatial strategy, are more inclusive and focus on integrated solutions, as opposed to sectoral or departmental decision-making process. A common example is the departmental focus on building more schools to enhance literacy rate, whereas in most of the cases, there is a high dropout ratio due to frequent diarrheal illnesses of the children. A further inquiry reveals that solution for high diarrheal incidence may not be with the health department, but in improving the clean drinking water and sanitation facilities. Thus, an outcome in one department (education) may be the result of investments in another sector (waster & sanitation). This kind of analytical decision making can only be possible, with an integrated Spatial DSS.

The spatial strategy is primarily to view the province through a geographical lens and to take advantage of the spatial / locational advantage of infrastructure, services, settlements etc. Non-spatial elements of the economy will remain just as critical.

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[15] Healy, P. 2000. 'Planning in relational time and space: Responding to new urban realities.' In G. Bridge and S. Watson (Eds), *A Companion to the City*. Oxford: Blackwell, 517-530.

2 Strategic Objectives of Developing the Balochistan Spatial Strategy

As stated in the previous section, regional spatial strategies typically aim to support objectives of financial, social and environmental sustainability. They seek to enhance efficiency, improve access to opportunities, and address spatial inequalities.[16] Rather than a limited focus on departmental and sectoral objectives and strategies, a spatial strategy looks at all the infrastructure and socio-economic needs of the area and aims at holistic planning, based on a comprehensive, integrated data set, which is spatial as well as tabular. Sectoral objectives and strategies should not be prescriptive. They should be developed in consultation with relevant stakeholders.

The objectives and sectoral priorities set below define the scope or thematic (topical/sectoral) focus of the spatial strategy for Balochistan, which in turn will provide a guideline for a series of subsequent decisions such as the types of tools and technologies adopted, resourcing requirements, institutional arrangements and the breadth of stakeholders involved. For example, in terms of the spatial data required, Google Earth base maps may be used for certain sectors given a time delay of three to four months, however this delay may not be tolerable for sectors that require more rapid decision making. Similarly, the skillsets, domain knowledge and the level of proficiency required among the human resources engaged to support the initiative will also depend on the thematic focus as the line departments, attached departments, semiautonomous bodies that will be relevant for the execution of this strategy etc.

2.1 International and Local Examples

2.1.1 Domestic, regional and cross-country examples

Before suggesting broad goals for BSS, it is useful to look at other examples from domestic and international jurisdictions. Overall goals can either be expressed as specific objectives (as in Punjab), broad vision statements (as in Japan) or key development principles and priorities (as in England) (shown below).

Punjab Spatial Strategy[17]	National Spatial Plan – Japan[18]	Regional Planning Guidance – England[19]	Comprehensive National Territorial and Development Plan (CNTDP) – Korea[20]	Concepts and Strategies for Spatial Development – Germany

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[16] For different types of strategic objectives and strategies, see: Todes, A. 2012. 'Urban growth and strategic spatial planning in Johannesburg, South Africa'. *Cities*, Special Section: Urban Planning in Africa (pp. 155-191), 29 (3): 158-165. https://doi.org/10.1016/j.cities.2011.08.004

[17] Official Punjab Spatial Strategy Document

[18] https://reconasia-production.s3.amazonaws.com/media/filer_public/c4/de/c4de7731-1af3-44be-88b9-64a56c2c0bf7/001127196.pdf

[19] https://gov.wales/sites/default/files/publications/2018-10/comparative-spatial-planning-methodologies.pdf

[20] https://www.futuresaudicities.org/wp-content/uploads/2017/07/Review-Lessons_National-Spatial-Strategy.pdf

• Improve the Global Position of Punjab in terms of Attractiveness & Competitiveness • Develop Regions based on Comparative Advantage • Transform Cities into Smart, Competitive and Livable Places • Sustainable Natural Resource Allocation and Management • Enhance the Quality of Life for all Segments of Society • Enhance Environment Protection and Management • Implementation of Integrated Spatial Planning System	• A country where people can feel safe and affluent • A vigorous country sustaining economic growth • A country exerting a strong presence in the international community	• The maintenance of high and stable levels of economic growth and employment Social progress which recognizes the needs of everyone • Effective protection of the environment • Prudent use of natural resources • Economy in the use of land • Enhancing existing environmental, social and economic capital • Achieving quality in development	• Competitive and Integrated national territory • Sustainable and Ecofriendly national territory • Elegant and Attractive national territory • Open national territory	• Growth and Innovation • Conservation of resources and shaping of cultural landscapes. • Ensuring services of public interest

2.1.2   How are other provinces doing it?

It may also be useful for the GoB to observe how Khyber Pakhtunkhwa and Punjab[21] have approached a spatial strategy especially in terms of sector coverage before defining the scope of BSS.

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[21] https://urbanunit.gov.pk/PSS/Index

<table>
<tr><td colspan="2">Khyber Pakhtunkhwa
The KP Urban Policy Unit has developed a 'universe' of sectors that they are planning to include in their geospatial mapping systems to develop land-use plans and master plans at the divisional and district levels in KP. These include:</td></tr>
</table>

<table>
<tr><td>1. Urbanization and hierarchy of human settlement</td><td>2. Demography</td></tr>
<tr><td>3. Agriculture and livestock</td><td>4. Trade</td></tr>
<tr><td>5. Commerce and Industries</td><td>6. Mines and Minerals</td></tr>
<tr><td>7. Energy</td><td>8. Communication (Road, Rail and airways, postal services and Telegraphs)</td></tr>
<tr><td>9. Health</td><td>10. Education</td></tr>
<tr><td>11. Tourism</td><td>12. Sports</td></tr>
<tr><td>13. Entertainment including historical and religious places,</td><td>14. Libraries</td></tr>
<tr><td>15. Museums</td><td>16. Zoos</td></tr>
<tr><td>17. Open Spaces</td><td>18. Security</td></tr>
<tr><td>19. Graveyards</td><td>20. Housing</td></tr>
<tr><td>21. Water (surface and ground water resources)</td><td>22. District Economy</td></tr>
</table>

Punjab

Punjab has taken a more conservative approach, defining its scope as:

1. Administrative Boundaries (Mauza & Ward Level)
2. Land Cover
3. Land Uses
4. Utilities Network
5. Forest and Protected Areas
6. Topography & DEM
7. Urban Extent and Density
8. Industries Census
9. Roads, Railways and Airports
10. Public Facilities & Spaces
11. Water & Irrigation Network
12. Soil Fertility and Texture
13. Mines & Minerals
14. Tourist Sites
15. Air & Water Quality
16. Health & Education Facilities

2.2 Guidelines for setting strategic and sector objectives

At the top level the strategy should aim to:

a) Identify and assess the potential of province wide growth corridors and nodes with competitive economic position, in particular with reference to the CPEC routes and developments,

b) Align where government should direct its investment to ensure improved public investment process in infrastructure while considering locational advantages of existing or new proposed human settlements

c) Provide the spatial expression of the Provincial Growth and Development and propose strategic interventions

d) Provide a set of normative principles or departure points that guide the Province's approach to dealing with socio-economic issues that are manifested spatially

e) Provide a basis for informed consensus on the province's spatial priorities by providing a map giving guidance for future spatial development f) Guide municipal development plans with normative principles, approach, and content.

More specifically, the Balochistan Spatial Strategy should help prioritize and coordinate public investment decisions with respect to the

- *Location* of infrastructure facilities, including roads, schools, hospitals, housing schemes, and others.
- *Investments priorities* in large-scale infrastructure projects, especially related to transport connectivity, industrial estates and even new urban settlements.
- *Integrating Municipal infrastructure* investments with national and provincial developments to best support local economic growth.

Towards this end, the United Nations Development Program's sustainable urbanization approach[22] can aide with the development of the sectoral strategy.

United Nations Development Program's sustainable urbanization approach

(i) Sustainability – through the development of appropriate policies for transport and mobility systems, energy systems, environmental protection and waste management;

(ii) inclusiveness – through policies for compact growth, spatial and social equality, public spaces and land development, governance systems and participation, migration, job creation, informality and entrepreneurship;

(iii) resilience – through policies that help manage risk and urban conflict, violence and crime

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2.2.1   Balochistan's Priorities vis-à-vis BSS Objectives

For Balochistan, spatial planning objectives can be derived from official policies and plans of GoB, in particular, the Balochistan Comprehensive Development Strategy (BCDS), which prioritizes a set of goals for the GoB to be achieved from 2013-20. These have been used to formulate a set of overarching priorities for the spatial strategy, as illustrated below.

BCDS 2013-20 Goals	Proposed Balochistan Spatial Strategy Objectives
Strengthening the democratic institutions through conscious, systematic and organized involvement of community groups in decision making in public programs at local level for upscaling transparency and accountability visibly	- Enhance transparency and accountability of economic planning, decision-making and development programming
Improving peoples' trust in governance by ushering in greater transparency in decision making and program execution through compulsory public information enactment	

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[22] United Nations Development Program (UNDP). 2016. 'Sustainable Urbanization Strategy: UNDP's Support to Sustainable, Inclusive and Sustainable Cities in the Developing World.'

Undertaking 'pro people' programs having clear regional balance and under the principles of equity	• Strengthen regional balancing of economic advancement • Prioritize investment in human capital • Support targeting for social protection and poverty reduction measures
Strengthening the capacity of the public sector to deliver through more transparent recruitment; transfer postings; capacity development and increasing institutional accountability over the performance	• Track, manage and improve institutional performance of provincial and local government agencies
Making expenditures effective by improving planning, increasing institutional oversight over execution and moving towards results-based management	• Improve the efficiency and effectiveness of public investment through stronger program identification, appraisal, implementation, monitoring and evaluation
Setting clear targets for growth; job creation; productivity and social indicators and evaluating administrative and political performance on the basis of these indicators and ushering in new standards of public accountability	• Identify bottlenecks in raising economic output, generating private investment and creating jobs in sectors with high growth potential and propose spatially relevant solutions

Overall, the strategic objective of BSS will be to stimulate growth and ensure provision of basic services through spatially targeted public investments. This will involve assessment of economic potential of each district/region, identification of potential growth nodes based on comparative advantages (economic potential, locational advantages, human development level) and identification, prioritization and sequencing of spatially optimal strategic interventions to help realize growth potential of each node or region.

For Balochistan, the BCDS 2013-20 planned development expenditure of Rs. 588 billion over seven years. A sectoral breakup as a share of development budget is presented in the table below. the BCDS has also prioritized a set of monitoring indicators for tracking implementation and outcome achievement. These have been marked against their respective sectors. The BSS objectives mentioned above have been mapped against sectors where they are most directly linked.

Sector	Share in BCDS 2013-20 budget	Monitoring Indicators	Direct Link with Proposed BSS Objectives
Road & Transport	17.90%		Growth, job creation and investment
School Education	15.10%	NER (Primary, Middle and Secondary Schools)	Investment in human capital
Irrigation Water	11.60%		Growth, job creation and investment
Health	7.40%	• Coverage of overall Immunization	Investment in human capital

		• Infant Mortality per 1000 live births • U5 Mortality per 1000 live births • Skilled Attendant at Delivery	
Minerals & Natural Resources Development	6.20%		Growth, job creation and investment
Pro Poor Programs	4.40%	Poverty (Multidimensional)	Targeting for social protection and poverty reduction
Agriculture	4.30%		Growth, job creation and investment Efficiency & effectiveness of public investment
Housing	3.80%		
Security	3.50%		
Energy	3.50%		
Higher Education	3.30%		
Livestock & Rangeland	3.10%		
Water Supply & sanitation	2.90%	• Piped Water Supply inside Houses • Rural Sanitation (No System)	
Urbanization	2.60%		Growth, job creation and investment
Fisheries	2.40%		
Private Sector Development,	2.10%		
Trade & Industry	1.40%		
Cross Cutting; Environment	1.10%		
Cross Cutting; ICT	1.00%		
Governance	0.70%		
Cross Cutting; Gender	0.70%	Gender Parity Index	
Cross Cutting Disaster Management	0.50%	Houses with unsafe roofs	
Social Welfare, Sports, Youth affairs	0.40%		
Religious Affairs & Interfaith harmony	0.30%		
Culture, Tourism	0.30%		

2.3 Proposed Sector Coverage for Balochistan

2.3.1.1 Key sectors for growth

Transport and Connectivity: *Improvements in transport and connectivity are critical components of any spatial strategy.*

Sectoral strategies should aim to improve accessibility through the development of mixed-use nodes and corridors, and investments in rail transportation, road infrastructure, bus networks, airports, seaports as required. At the city-level, sectoral strategies should support and facilitate investment in public transportation and improve walkability. Care should also be taken to ensure that land use, housing and transport policies are integrated to reduce long-term economic costs. The BCDS 2013-20 primarily focuses on road infrastructure, particularly as most infrastructure is in dire need of repairs, however, for long-term sustainability and growth, the scope of transport policies needs to be considerably widened to include other forms of transport infrastructure and mobility requirements as well. Finally, it is crucial for sectoral strategies to focus on improvements in rural connectivity and transport services and address rural marginalization and exclusion.

Health and Education*: Improvements in access to health and education is integral for human development, and long-term prosperity. Sectoral strategies should not only focus on the delivery of quality health and education services and infrastructure, but also plan to create healthy spaces that improve quality of life, particularly in urban centers.*

Balochistan faces significant challenges in the health and education sector. To improve access to health, the BCDS 2013-20 focuses on strengthening primary health care (with an emphasis on mother and child health services) and addressing challenges of health sector governance and accountability. To improve access to education, it highlights key goals of the Balochistan education sector plan alongside other interventions. These focus on meeting commitments as per Article 25A, improvements to education quality and child learning outcomes, governance and management of schools, as well as strategic interventions at all levels. The BCDS 2013-20, however, does not make use of spatial analysis to identify regional disparities in health and education. In this regard, Punjab's Spatial Strategy can offer guidance. The PSS uses an educational composite index and a health dimension index to spatially rank districts. A similar analysis of education and health indicators in Balochistan can play a key role in identifying areas most in need of investment and can form the basis of health and education sectoral strategies developed as part of the BSS.

Urban Development: *Planning for urban development is key for long-term economic, social, and environmental sustainability. Cities offer tremendous opportunities for social and economic development. However, they also present new challenges related to poverty, inequality, environmental degradation, climate change that must be managed and addressed through various planning interventions.*

The BCDS includes an outline of the province's urban development strategy. It prioritizes development in all district headquarter cities, with an initial focus on Quetta, Pishin, Gwadar, Lasbela, Kech, Loralai, Sibi, Khuzdar, Nasirabad, and Killa Abdullah and aims to develop cities as growth poles. The strategy refers to master planning exercises, changes in regulations and zoning, strengthening of property rights and land titling systems, establishment of employment zones, improvements and investments in housing, water,

industry, health and education infrastructure, rural connectivity, and improved governance mechanisms. Prior to developing a detailed sectoral strategy for urban development as part of the BSS, it will be essential to first evaluate the effectiveness of the urban development strategy as per the BCDS, and identify opportunities and constraints faced during the implementation stage. The sectoral strategy should incorporate lessons from the evaluation and support integrated sustainable urban development by bringing together key stakeholders, earmarking finances for implementation of the strategy, and delineating appropriate institutional mechanisms and capacity-building measures. Planning for urban development is key for long-term economic, social, and environmental sustainability. Cities offer tremendous opportunities for social and economic development. However, they also present new challenges related to poverty, inequality, environmental degradation, climate change that must be managed and addressed through various planning interventions.

2.3.1.2 Proposed Priority Sectors

Based on this analysis, the following sectors may be prioritized by the BSS, given they:
- account for a significant share of planned medium-term development spending;
- carry monitoring indicators that are captured by the CDS which signals their importance
- directly align with the proposed objectives of the BSS (above).

Other sectors and parameters may be added as implementation gains momentum.

Prioritized Sectors	Examples of possible GIS Parameters
1. Road & Transport	Provincial Highways, Secondary Roads, Rural Roads, Access Roads, Link Roads, Shingle Roads, Tracks and Bridges, etc.
2. School Education	Primary, Middle and Secondary School facilities
3. Irrigation Water	Irrigation channels and courses
4. Health	BHUs, RHCs, THQs, DHQs and MTIs
5. Minerals & Natural Resources Development	Active and exploratory mining sites
6. Pro Poor Programs	• NSER beneficiary households • MDP headcount ratios
7. Agriculture	Soil Fertility and Texture, Land Cover, Agricultural land (rain-fed and irrigated) etc.
8. Housing	Land available for housing projects (waqf properties, land under the control of local civil administration, etc.)
9. Security	Crime hotspots, police stations and posts, prisons, probationers and parolees, etc.
10. Energy	Mapping of transmission lines, transformers, connected and unconnected communities, etc.
11. Higher Education	Public and private sector colleges and universities
12. Livestock & Rangeland	Assessment of rangeland foraging capacity, under-grazing and over-grazing of communal and private land etc.
13. Water Supply & sanitation	Existing water supply schemes, ground-water aquifers, piped network, etc.
14. Urbanization	Urban extent and density, rural-to-urban migration patterns, informal housing (slums), etc.

15. Fisheries	Catch, fishing effort, temperature, migration patterns, etc.
16. Private Sector Development	Major commercial hubs and marketplaces
17. Trade & Industry	Industries census

3 Process of developing a spatial strategy

3.1 Defining the Institutional Home of the BSS

Spatial strategies are best developed in collaboration with all departments and key stakeholders with a view to guide spatial investment decisions across departments in a coordinated way. Experience from other countries suggests that spatial strategies have been unsuccessful when they have been designed without any institutional mechanism to link and coordinate such development.[23]

UN-Habitat, in particular stresses on 'coordination and integration of policy ideas of line-function departments'[24] as key for success. The planning stage should include both public, private and civil society actors. The success of a spatial strategy also depends on ownership across the public sector, as well as the capacity and willingness of various departments to implement the selected strategies.[25] Without such ownership and coordination, as well as an understanding of the political-economy factors influencing adoption, such strategies are likely to be ineffective.

This mandate of the P&D makes it the most appropriate department to house and manage the Balochistan Spatial Strategy. The BSS would not only add value to the performance of province wide development schemes but would also facilitate the functioning of P&DD, as it is fully aligned with its role as per Rules of Business (see Box 2 below).

Box 2: Planning and Development Department functions

As per Schedule I of the Balochistan Government Rules of Business 2012, the role of Planning & Development Department is inter-alia:

- Preparation of Long-term development plans and coordination in the development of 5 year plans / rolling plans and other long term development plans;
- Acting as a catalyst between various development departments, in order to improve the pace and quality of economic development.
- Determining policy for the approval of development schemes in the province.
- Devising strategy for investment priorities based on the availability of internal and external resources.
- Compilation of provincial statistics & data with the help of provincial bureau of statistics.
- Helping in the formulation of policy regarding planning and devising guidelines for the development projects
- Approval, monitoring, implementation, and allocation of development outlays for development programs and projects.
- Establishment of MIS (Management Information System) for provincial line departments for the purpose of planning & Monitoring.

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[23] UN-Habitat. 2009. 'Global Report on Human Settlements 2009: Planning Sustainable Cities.' London: Earthscan
[24] Ibid
[25] See Albrechts, L. 2004. 'Strategic (spatial) planning re-examined.' *Environment and Planning B: Planning and Design*.
https://doi.org/10.1068/b3065

While principal responsibility for spatial strategy development should rest with the P&D department, other departments of government should also be involved in developing the strategy. The Department of Provincial Transport Authority and Department of Communications, Works, Physical planning & Housing, for example, can be responsible for the regional transport strategy, which forms part of the spatial strategy, and the Department of Industries & Commerce is likely to maintain a strong interest in ensuring that the strategy supports economic growth. Dedicated 'planning teams' (subunits of the Project Management Unit (PMU)) can be established in these departments, and the P&D department can assess which other departments of the provincial government need to be engaged. The PMU will be the main implementation unit of the BSS and will be housed within the P&D Department, as the secretariat of the Balochistan Spatial Planning Authority (see sections 3.2, 3.3 and 5.1).

3.2 Defining Stakeholders

3.2.1 Primary Stakeholders

While this is not an exhaustive list, other key public sector stakeholders who should play a central role in the development of the BSS include:

Communication Works, Physical Planning and Housing Department: The primary function of the Communication Works, Physical Planning and Housing Department is to enhance connectivity and accessibility across the province. It is responsible for constructing and maintaining roads and carrying out construction work for government departments. The department is also responsible for housing development. The department should hence play a critical role in the development and implementation of sectoral strategies.

Provincial Transport Department: The provincial transport department oversees transport provision. Its involvement is crucial for improving accessibility across the province.

Industries and Commerce Department: The Industries and Commerce Department is responsible for the development of the industrial sector in the province. It promotes industries and entrepreneurship. Involvement of the department will help shape strategies for economic development, urban growth, and job creation.

Environmental Protection Agency (EPA): EPA serves as the primary environment regulatory body for the province. It is responsible for implementing relevant national and provincial laws as they pertain to the environment and developing policies that protect the environment. Its involvement will be crucial for developing strategies for sustainable environmental management and ensuring implementation of the Balochistan Environmental Conservation Strategy.

Energy Department: The Energy department looks after critical energy resources within the province. Investments in energy infrastructure are critical to meet the strategic objectives of the BSS. Inclusion of the energy department is important to determine sector priorities and improve provision and access over the next two decades.

Education Department: The Education department is responsible for improving quality of education across the province. The BCDS notes that reforms in school education, as well as higher education will

'shape Balochistan's growth trajectory' (p.14). Involvement of the department will help determine infrastructure requirements and help achieve sectoral objectives of inclusive growth.

Health Department: The Health department focuses on health care planning, provision, and management, with a view to improve health standards across the province. Spatial assessments of health facilities and outcomes can determine the localities and types of investments required to facilitate equity across the province.

Irrigation Department: The Irrigation department manages scarce water resources and seeks to develop efficient irrigation systems. For infrastructure development plans and strategies to be effective, water resource management and conservation of irrigation water resources is critical. Involvement of the irrigation department is therefore important in the development of the BSS.

Local Government and Rural Development Department (LG&RD): the LG&RD Department provides administrative support to local councils (including metropolitan corporations, municipal committees, district councils, union councils), looks after *katchi abadis,* spatial planning and housing, building control, municipal services, taxation, among other functions. As such, the involvement of the department is central for the success of the BSS.

China Pakistan Economic Corridor (CPEC) Authority: Promulgated by the President through an ordinance in October 2019, the CPEC authority aims to oversee CPEC related activities and investments in infrastructure. Coordination with the CPEC Authority will hence be critical to meet strategic and sectoral objectives of the BSS.

National Highway Authority (NHA): The National Highway Authority is responsible for delivering, maintaining and operating the national highway network. As it directly shapes connectivity across the province, it will be important to involve the authority from the start.

As per the BCDS, the GoB plans to develop three new Regional Development Authorities (RDA), and restructure three existing development authorities including Quetta Development Authority, Gwadar development Authority and Balochistan Development Authority. All RDA's should be involved and consulted for the development of the BSS.

3.2.2   Secondary Stakeholders

Likewise, while not exhaustive, secondary stakeholders include the following departments and entities:

- o   Social Welfare, Special Education, Literacy/Non-formal education and human rights
- o   Women Development
- o   Mines and Minerals
- o   Agriculture and cooperatives
- o   Culture, Tourism and Archives

Overall, coordination with city, provincial and federal government agencies is key for the success of the provincial spatial strategy. Alongside, a range of actors such as universities, chambers of commerce, trade unions, civic associations, citizen groups etc. should also be involved and consulted.

3.3   Developing a Subnational/Provincial Planning System for Balochistan

Preparing and implementing the BSS requires a proper planning system with clear mandates for the various key organizations within the system. This entails some changes in institutional and legal framework of planning. There is a need for an in-depth review of the existing planning and administrative structures that guide land use and capital investment planning in the province, in order to facilitate an integrated and objective oriented planning and infrastructure investment.

The objective of such review is to identify gaps in the process and procedures through which spatial plans are created and approved and how capital investment plans and investment proposals are submitted and approved. Measures need to be taken to identify the challenges, constraints and bottlenecks that inhibit the coordination of planning among departments, districts, authorities, autonomous bodies and local governments. A planning system needs to be devised to improve the coordination of planning and infrastructure investment activities across the province.

The planning system should allow for the linking of "strategic" and "statutory" planning. In a nutshell, provincial and regional spatial plans are about the province and constituent districts and municipalities identifying their priorities, issues and problems, which determine their vision, objectives and strategies followed by the identification of projects to address the issues. This whole system is in a nutshell the spatial strategy, as without a formal institutional design, this whole would just be yet another consultant's report.

3.4   Organizing Consultations and Communications

A key element of the development of BSS is a very elaborate and well-designed system of consultations and communications. This system can have three key features:

Inclusive: The consultation should be a kind of 360 degrees process, with all stakeholders, right from provincial government to key departments, agencies, authorities and municipalities in the public sector, chambers of commerce and civil society. The objective should be to gather as much information as possible relating to public sector development.

Multiple rounds: The consultation should be carried out in at least two (but ideally three) rounds. The first round is introductory and a learning process for the PMU. The second round would be to present the draft strategy components to the relevant stakeholders, getting course correction. In the third round, the final product will be presented and buy-in created, training provided on the use of BSS and all DSS subsystems. It may be clarified once again, that though institutional home for BSS is the P&D Department, yet the users are likely to be almost all public sector entities, right up to local level.

3.5   Cost Estimates

Detailed cost estimates for developing the BSS are provided in Annex – C of this document.

4 Defining Data Collection Processes and Protocols

4.1 Why is spatial data important?

To untangle the complexities of regional planning and economic growth, it is important first to understand the scale of the challenge that needs to be addressed. The primary tool that helps planners do this is data, which takes a variety of forms including, but not limited to, administrative boundaries, population clusters and densities, connectivity and mobility via roads, railways, and airports, natural resource distribution, industrial clusters, the distribution of built-up area and agricultural land, as well as population demographics. This data on its own however, while telling in a number of ways, does not allow us to develop a complete picture of the region, and must be used in conjunction with maps and other forms of spatial analysis which allow spatial visualization and coordination.

Typically, spatial analysis starts with a base map, or layer, upon which multiple other layers are applied. For the purpose of this strategy, this base layer would be the borders of the Balochistan province, on top of which layers showing administrative boundaries at the district, tehsil, and where possible, *mauza* level, would be applied. Visualizing data points such as population, income, housing stock, connectivity, industrial and agricultural growth, and the spread of public services such as health and education allow policymakers and planners to effectively gauge how the region is evolving, what is holding back economic and social development, and how future changes might affect inhabitants.

Mapping of human settlements, or population clusters, will be critical. As mentioned in Section 1, Balochistan's population is spread unevenly across the province, and there is limited analysis of population densities, distribution and human settlement patterns. A population density map using census data (ideally lowest administrative level) can help the government identify the size and distribution population clusters, evaluate the most appropriate unit for service delivery, and plan for compact growth in the future. Overlaying population data with the layers mentioned in the previous paragraph (housing, health, education) will further help the government develop appropriate strategies for service provision, infrastructure development, and long-term consolidation/growth. Likewise, a population growth map with projected population figures, breakdowns by age can also support the government's planning efforts.

It is unlikely, however, that much of this data will be readily available, especially in the form of spatial datasets. As result, most of this data will have to be collected or generated. The tools available to do this include primary and secondary data collection, image processing, remote sensing, the use of Big Data such as that generated by cellphone usage, and geographic information system (GIS) based digitization to demarcate tehsil and mauza boundaries.

The size of the challenge that simply collecting and generating data represents can also not be understated. The key challenges involved include decisions about how to collect new data, optimizing the use of existing datasets, and developing the skills and human resource capacity required to not only collect and collate data, but also maintain and regularly update it. Existing data would only be beneficial if it can be combined with new primary data, and many policy questions could only be answered by combining new data with existing data such as demographics. A significant challenge that the government is likely to come across is in sharing and accessing data from various departments, and then subsequently merging

the different datasets together. Other challenges include lack of standardization in storing data, spelling variations when data uses a combination of English and Roman Urdu, and security concerns.

There are a number of ways in which the quality of data can be ensured. A good regulatory structure includes data standards and institutional arrangements that place checks and balances on how data is stored, accessed, and used. Given the sheer volume of data collected and analyzed, security and identity protection become very important concerns.

Data collection is also a costly process. An important caveat that must be kept in mind while collecting the data and developing the strategy is that the benefits of more data do not always outweigh the costs. As such, all efforts at data collection must be guided by specific policy questions and must be supported throughout by stakeholder buy-in.

4.2   Data Requirement (Types and Availability)

4.2.1   Spatial & Non-Spatial

The primary foundations for the development of BSS is an extensive, comprehensive and well-planned data inventory. This includes both spatial (imageries, maps & map related) as well as non-spatial (alpha numeric and text) data, across all departments, all sectors and all districts.

Developing a Data Development Framework: For data collection, the P&D department needs to develop a framework to carry out a systematic exercise of data acquisition, data storage, data visualization, data sharing and data analytics.

Spatial Data: Spatial data is primarily in the shape of maps and has to be linked with the satellite imagery.

Satellite Imagery: Satellite imagery forms the basic canvas for collection and analysis of spatial data. There are multiple options for acquiring and processing this imagery. The variable decision-making parameters include the resolution of the imagery, which could be high resolution for entire province or a mix of high and low resolution, for urban and rural areas respectively. This option significantly reduces the cost, without any compromise on the quality of end product. Imagery could be purchased, or some service providers give the option of licensing a library of current and historical images and the cost depends upon the level of service acquired and the duration of license.

Final decision should be determined by the need assessment and the overall design of the data base, in addition to the cost analysis.

4.2.2   Secondary & Primary Data

Data collection can be carried out in phases.

Step 1: Developing a framework for data requirements, data management.

- *Objectives of data collection*: During inception phase of the BSS development, the consultant should assess and discuss the overall design parameters of the BSS. That will determine the quantity, quality, depth and scope of data collection. The usual advice is that in the initial phases, data acquisition should be targeted and objective oriented. Later on, layers and indicators can be added as per need.

Data collection is an expensive exercise and data is a perishable commodity, in that it becomes outdated, if not updated regularly.

- *Making a long list of data (Spatial as well as non-spatial)*: Based on the scope of the BSS and the objectives defined above, the consultant should prepare a long list of the data that would need to be collected in the 1st phase. This has to be a comprehensive list, but with some qualifiers for each indicator (z sample has been given as part of Annex B).

Step 2: Acquisition of all available data, collected under any other program, by any of the departments or projects.

Step 3: Acquisition of primary data, that still needs to be collected. Primarily this should be spatial data that will be collected, while at the same time adding textual and alpha numeric attributes of the spatial data units. This exercise should be done in active collaboration with the concerned departments, to ensure full ownership, sharing and use.

The IT specialist at the PMU can design the data servers and other hardware required for sustainable and secure data collection and storage for the BSS. Ideally speaking, either the existing data center of the P&D department will need to be upgraded, or a new center will need to be established. It is strongly advised to develop a state of the art of secure data center, with a physically distanced disaster recovery duplicate center, which is updated frequently or in real time, depending upon the connectivity and the architecture.

4.3   Data collection tools and techniques

The first step in data acquisition has to be the development of a comprehensive inventory of existing data sets that might be available in various departments, districts, and even project offices. This inventory needs to be not just a listing of data, but must include defining parameters, like ownership, date of acquisition, accuracy level, geographical scope etc. A golden principle of data collection in the public sector is that data once collected should be used by all agencies and departments.

Initially, secondary data is collated, as it is always less expensive. Secondary data is usually available in the census and survey reports of the Provincial Bureau of Statistics (BOS) and many donor agencies. Once the secondary data is collected, the gaps that need to be filled in through primary data collection will become apparent.

Data from the field can be collected by hiring temporary surveyors. Since all primary data has to be spatial, the most common tool used is an android phone set, with a special data collection app, developed and installed in a secure manner. It would be good, if the data is transmitted in real time to the PMU servers and checked for quality on daily basis.

In addition to field surveyors, GoB will need a team of data checkers that can be based at the PMU. The team can check each y unit of data received. This team deputed to checking quality will have to be trained and provided detailed checklist for quality. On top of this level, a team of monitors will need to be placed, to randomly check data to ensure that end up with very high-quality data.

In Punjab, the surveyors hired were supposed to bring their own motorbikes android sets and internet. They were just paid for correct and verified data units collected and accepted. This ensured minimum procurement of hardware, which is usually an expensive and wasteful exercise. In addition, the data entry

operators etc., working at PMU data lab can also be asked to bring their own laptops, instead of PMU purchasing the inventory. They just log in to the data server and download / upload data, which they were neither allowed to store nor transmit, without authorization.

Data storage & Sharing protocols: Data in the public sector is a complicated affair. There will be many owners of the data and there would be many layers of data, some of which the departments would not like to share. The PMU will be well advised to develop comprehensive data storage and sharing protocols, get these approved and notified, so that all stakeholders are on board and follow these protocols.

Data Security protocols: Data security is another critical issue, as much of public sector data, especially spatial data is potentially a security risk and need to cover this risk in a professional manner.

4.4   Defining Data Analytics & Development Strategy

Data collected will need a strong and purpose-oriented system of data analytics, that can prepare reports and systems for strategy development and use. The following are key aspects of data analytics, based on spatial and non-spatial data, collected for the purpose.

Descriptive analytics: Describes what has happened over a given period of time. A spatial data analysis of the past (for example last 20 years) gives a good analysis of how cities have been growing, how infrastructure has been developing etc. This descriptive analysis presented in the shape of high-quality maps paves the way for higher level of analytics.

Diagnostic analytics: This level of analytics focuses more on why something happened. This involves more diverse data inputs and a bit of hypothesizing. This usually is based on finding correlations. In development sector, the impact of highways and roads on new settlements and direction of city growth is an example. Impact of some agriculture extension project on the growth of certain crops, or linking new schools in a tehsil with higher literacy rates etc.

Predictive analytics: Based on analysis of the past trends as would be evident from the diagnostic analytics, an educated guess can be made of what direction the development indicators would take, because of the proposed investments or infrastructure. This could be predicted in the medium to long term, depending upon sector and outcome.

Prescriptive analytics: Prescriptive analytics is the suggested course of action, based on previous levels of analysis. This level is in fact the strategy development level, as these analytics would guide us as to what is likely to happen, based on proposed investment projects. This is also the basic tool used in a decision support system

Simultaneous with the data collection and analytics, there will be a need to develop IT based systems to make use of this data, towards the objective of making a live decision support system (DSS). The contours of this DSS, which in fact is designed to be a combination of individual department wise sub-systems can be designed, shared and approved during the initial phases of the project.

5 Human Resource Requirements

5.1 Technical expertise Requirement

The BSS formulation will require technical expertise in the following knowledge domains:
- Regional, urban, sectoral and strategic planning;
- Environment/ecology
- Infrastructure
- Institutional development
- Survey experts
- GIS development and management
- Sector experts

The specifics of team composition will need to be determined once the institutional modeling for the BSS is clear. It should also be noted that international experts may be required in certain areas to bolster capacity. The Punjab Urban Unit engaged experts from Jordan and Germany on regional and urban planning, for this purpose. The details from Punjab's PMU are annexed (see Annex A). An illustrative structure is provided for the BSS PMU, which can be modified.
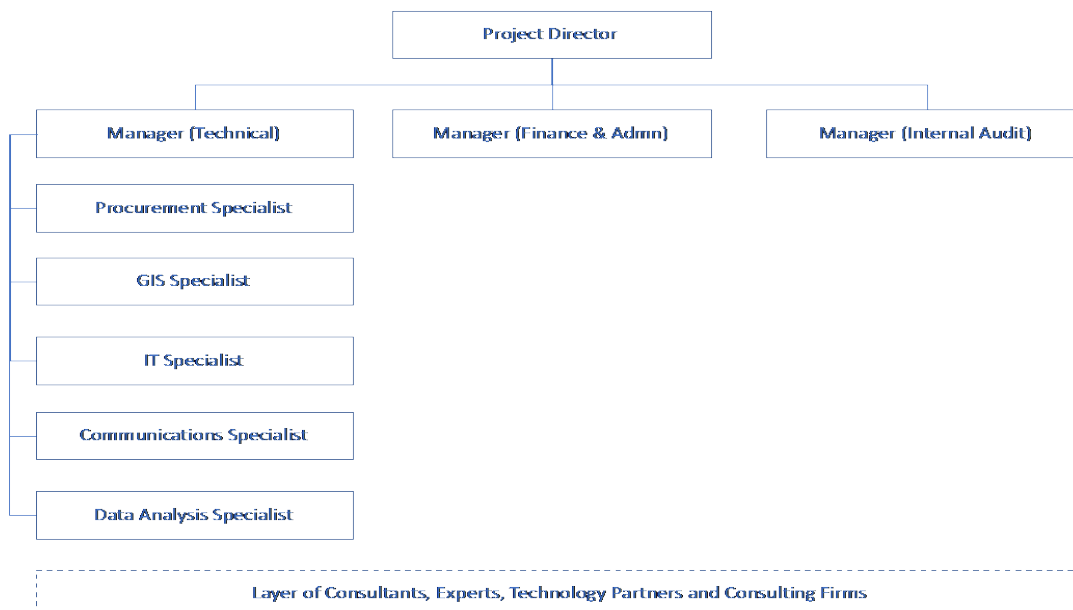
6 Institutionalization

6.1 Mapping the Institutional Space

The following matrix maps key institutional stakeholders at the provincial and local levels attached to each prioritized sector to perform a range of functions, in accordance with the GoB Rules of Business 2012 and the Balochistan Local Government Act 2010. These functions range from policymaking, funding, planning and development, regulation collection of user-fees, among others.

Prioritized Sectors	Line Departments	Attached Departments and Autonomous/Semi-autonomous bodies or Specialized Units	Local Governments
1. **Road & Transport**	Communications, Works, Physical Planning and Housing	• Offices of Chief Engineers (Sibi, Khuzdar and Quetta Zones)	• Union Councils (farm to market roads) • District Councils • Urban Councils [26]
	Transport Department	• Provincial Transport Authority	
2. **School Education**	Education	• Directorate of Schools • Policy, Planning & Implementation Unit	• District Councils • Urban Councils
3. **Irrigation Water**	Irrigation	• Directorate General of water Resources planning, development and monitoring • Offices of Chief Engineers	• District Councils • Union Councils (karez)
4. **Health**	Heath	• DGHS • Directorate of Nursing	• District Councils • Union Councils • Urban Councils
5. **Minerals & Natural Resources Development**	Mines and Minerals	• Directorate General of Mines and Minerals • Inspectorate or Mines	NA
6. **Pro Poor Programs**	Social Welfare, Special Education, Literacy, Nonformal Education and Human Rights Department	• Directorate General of Social Welfare • Directorate of Literacy and Non-Formal Education	• Urban Councils
7. **Agriculture**	Agriculture & Cooperatives	• Directorate General of Agriculture (Extension)	• District Councils

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[26] Municipal Committee, Municipal Corporations and Metropolitan Corporation Section 10 (iii), Balochistan Local Government Act 2010

		• Directorate General of Agriculture (Research) • Directorate General of Agriculture (Engineering) • Directorate of Crop Reporting Services • Cooperative Societies	
8. Housing	Communication Works, Physical Planning and Housing	• Offices of Chief Engineers	• Defined as a municipal service to be provided by a Local Council
9. Security	Home & Tribal Affairs	• Police • Prisons • Balochistan Constabulary • Reclamation & Proclamation	• Commissioner • Deputy Commissioner • Assistant Commissioner[27]
10. Energy	Energy	• Balochistan Energy Company Limited	NA
11. Higher Education	Education	• Directorate of Colleges	NA
12. Livestock & Rangeland	Livestock and Dairy Development	• Directorate General of Livestock and Dairy Development	• Urban Councils (optional) • District Councils
13. Water Supply & sanitation	Public Health Engineering	• Quetta Water and Sanitation Authority	• Urban Councils • Union Councils • District Councils
14. Urbanization	Planning & Development Department	• Balochistan Development Authority • Gwadar Development Authority	• Urban Councils
	Urban Planning & Development	• Directorate of Civil Works	
15. Fisheries	Coastal Development & Fisheries 4 Department	• Balochistan Coastal Development Authority • Pasni Fish Harbor Authority	• Urban Councils (optional)
16. Private Sector Development	Planning & Development Department (for PPP) Various line departments	• Various agencies	• Local Councils
17. Trade & Industry	Industries and Commerce Department	• Lasbela Industrial Estate Development Authority (LIEDA)	• Urban Councils (drainage) • District Councils (cottage industry)

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[27] Section 9, Police Act 2011

		• Gwadar Industrial Estate Development Authority (GIEDA)	

6.2 Institutional Considerations

The institutional stakeholders identified above, play a broad range of direct roles associated with public policy in each relevant sector: policy making, financing, planning and development, regulation, collection of user fees, etc. Therefore, regardless of specific structural choices, these stakeholders must be appropriately engaged during the development and implementation of the BSS.

There are essentially five essential roles that are to be performed by existing or new bodies assigned with the responsibility for implementing the BSS. They may be shared across different bodies or clubbed into single ones, as illustrated below:

A) **Providing policy guidance and oversight –** The Punjab Spatial Strategy envisages a Spatial Planning Council for this purpose, headed by the Chief Minister with other members drawn from the provincial Cabinet and the provincial Assembly, as well as members appointed from the academic and research community and NGOs/civil society. Similar structures are found in Germany (Standing Conference of Ministers), Korea (National Territory Policy Committee), Malaysia (National Physical Planning Council) and Morocco (High Council of Spatial Planning headed by the King).

B) **Implementation hub –** One central body must serve as the implementation hub for the BSS, providing secretariat support to the high-powered oversight committee (above), coordinating actions horizontally and vertically within and outside of government, and gathering data for monitoring, reporting and problem-solving. The Punjab Spatial Strategy splits these functions between the following proposed structures:

- Spatial Planning Authority headed by the Chairman, P&D Board with other members being ex-officio Secretaries of relevant departments, as well as DGs of relevant attached departments and autonomous/semi-autonomous bodies.
- Strategic Support Unit housed within the P&D Department, headed by an independent DG who is also the administrative manager of the Spatial Planning Authority.

In KP, regional and urban planning is carried out by the Sustainable Development Unit, the Urban Policy Unit and the Resource Center or GIS Hub, all housed within the P&D Department.

C) **Provincial and sub-provincial implementation –** Responsibility for implementing measures committed by the strategy and achieving the time-bound milestones will rest with individual line departments at the provincial level, as well as regional and local administration. The PSS repurposes planning cells/wings in each line department as Strategy Nodes while Regional Planning Committees at the divisional level have been proposed to translate the provincial Strategy into divisional plans under the leadership of Commissioners, supported by Deputy Commissioners.

D) Technical advisory and support – To bridge the capacity gaps in provincial and local government departments and agencies, the PSS proposed ongoing technical support and assistance provided by the Urban Unit. The DG, Strategic Support Unit also serves as the ex-officio head of the Urban Unit to manage a team of experts in urban and regional planning as well as other technical domains.

E) Financing Arrangements - The PSS also provides for a dedicated Spatial Planning and Development Fund to be controlled by the Spatial Planning Authority, which can receive funds from the federal and provincial government, as well as loans and grants raised from other sources.

6.3   Proposed Institutional Architecture for BSS

Broadly speaking, the Balochistan Spatial Strategy should be integrated within the government at two levels. Firstly, it should be used for identification of priorities. It should also highlight the priority geographical areas and sectors for the government that can benefit the most from investment inflow. Secondly, it should inform resource allocation decisions across the government. It must be noted that BSS may be housed at P&D, but without cross-cutting embedding across the government, the real dividends cannot be reaped.

The following structure is proposed on Punjab's model, but it can be modified based on GoB's needs:
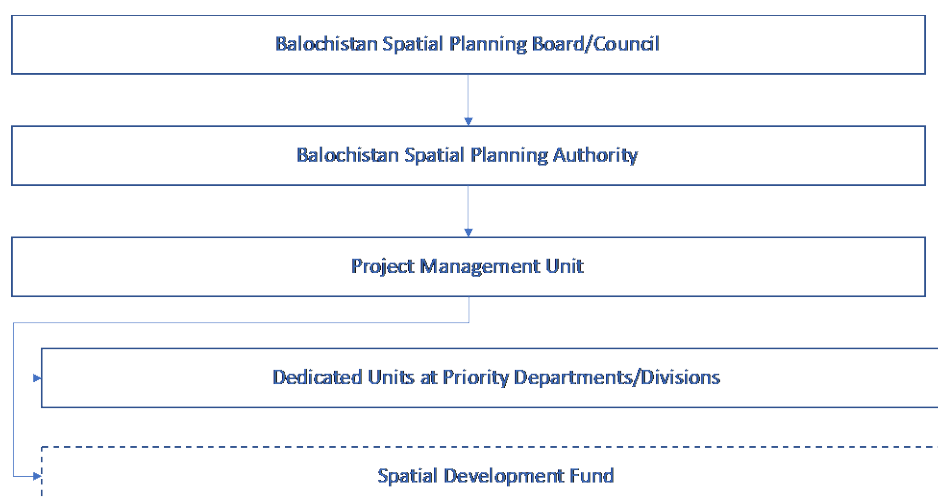
Policy Guidance & Oversight	Balochistan Spatial Planning Board/Council – To be headed by the Chief Minister with members drawn from legislature, academia & thinktanks, etc.
Implementation Hub	Balochistan Spatial Planning Authority – To be headed by the ACS (Planning) with Secretaries of relevant departments as ex-officio members to ensure sector representation

	Project Management Unit – To be housed within the P&D Department, as the secretariat of the Balochistan Spatial Planning Authority
Sector-Level Implementation	The priority departments should set up smaller dedicated units to work closely with the PMU and developing their own regional strategies/plans. In case of other departments, enhanced role of existing planning wings/capacities at department/divisional level, initially supported by the PMU through trainings, etc. should suffice.
Technical Advisory & Support	This function should be performed by the PMU but may be supported by development partners.
Financing	Establishing a dedicated fund may be considered, provided there are some clearly identified sources of funding.

6.4   Integrating with Public Investment Management Regime

The Spatial Strategy should be plugged – ideally through formal Rules and Standard Operating Procedures (SOPs) notified by the P&DD, GoB– into the following main stages of the public investment planning cycle including project identification, planning, formulation, appraisal; and monitoring & evaluation.

Project Identification & Formulation - Integration with the project identification function with the BSS may entail the following measures:

- The identification of schemes should ideally be linked to international (e.g. SDGs) national (e.g. Vision 2025) or provincial (e.g. BCDS) plans, policies and commitments. The BSS may be formally notified among this list of prioritized policy documents which should influence project identification by line departments, attached departments and local governments.
- The BSS should lead to development of a medium-term development framework that should inform ADP formulation decisions.
- Departmental sector plans/strategies should be informed by the BSS and in cases where these plans already exist, they would need to be revised in light of BSS.
- The Indicative Budget Ceiling communicated by P&DD to all line departments in February of the planning year should also ideally be formulated with due deference to BSS priorities.

The project Concept Notes, PC-Is and PC-IIs should include geospatial coordinates for schemes (individual schemes in case of umbrella projects). Feasibilities and surveys carried out for surveys under approved PC-IIs should include geospatial assessment through the GIS support system established for the BSS. In addition, the GIS running behind the BSS should also be able to generate reports that furnish required data for project planning purposes e.g. baselines for project outcome indicators.

Project Appraisal – Project appraisal carried out by P&DD should include GIS assessment for projects that are complex in nature, cost above a pre-determined threshold (e.g. Rs. 10 million) or fall into a prioritized

sectoral category. The Punjab Strategy, for instance, aims to spatially assess 80 per cent of the total value of all infrastructure PC-Is as well as all industrial sector PC-Is, especially those valued at Rs. 200 million or higher. Such assessment may include (among others):

- Distance from human settlements that the project aims to serve
- Road networks that connect the proposed facility to users
- Existing facilities within the same village/neighborhood, Union, Tehsil or district that precludes the need for the proposed project
- Existing facilities that complement the new project e.g. feeder schools for colleges
- Factors that might delay proposed projects, raise their costs or otherwise impede project implementation e.g. problems with land acquisition, challenging terrain, etc.
- Local spatial objectives that are hampered or promoted by the new scheme, for instance encroachment upon scarce agricultural land

Projects being considered for revision (exceeding 15 per cent of originally approved project scope), re-appropriation (within project components or from one project to another), early financial releases or supplementary demand for inclusion during the planning year should especially be prioritized for BSS/GIS assessment.

As per the draft Planning Manual developed by P&DD, the Department is already planning automation of the planning cycle where GIS analysis of schemes is one of the planned features of the intended system, including specifically:

- Assess viability of the project proposals using GIS Assessment tools and analyses
- Geo tagging with portable devices
- Integration of baseline data of population, administrative units and departmental innervations in respective sectors
- Up to Union Council Level Boundaries, roads and other geo tagged (spatial data) information for Project assessment

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This assessment should be carried out before the projects are put up for PDWP review/deliberation. Geospatial analysis and BSS review should be added to existing guidance on social, economic, financial and environmental appraisal of projects, along with detailed SOPs.

Similarly, prior to the Departmental Sub Committee review, draft PC-Is received from executing agencies (most often the Communication & Works Department) should undergo a similar assessment at the planning wings/cells within line departments. It is assumed that they will have access to the central GIS established to support the BSS. Proposals for foreign aided projects should again, be reviewed through the same process before being submitted for review of the Concept Clearance Committee (Planning Commission) by the sponsoring agency.

Project Monitoring & Evaluation - Monitoring reports submitted by line departments, including the PC-III (a) and (b), wherever these are duly filled, should be digitized and integrated within the automated

planning system being developed by P&DD. Similarly, reports of external monitoring carried out by P&DD or international donors for foreign funded projects should also be uploaded into the system. Data from both internal and external monitoring reports should be integrated with the BSS GIS to allow spatial mapping of ongoing schemes live in the PSDP.

The monitoring visit plans should also be carried out based on geographical considerations to efficiently monitor geographically close projects, across various sectors.

Geospatially mapped monitoring data should be discussed in the quarterly progress review meetings held between P&D and line departments. Ideally, PC-IV templates should also be updated to include geo-spatial data so that an asset registry of completed infrastructure schemes is maintained by the GIS.

6.5   Legal Support for the BSS Institutional Architecture

The institutional arrangements described in this section should ideally be backed by provincial legislation. This will signal the GoB's commitment to the initiative to public and private sector stakeholders; ensure buy-in from the political leadership; safeguard the system from rollback in the event of political regime change; and help implementation by legally obligating all relevant stakeholders to perform their due roles and responsibilities. The Punjab Spatial Strategy planned for a Spatial Planning Act to legalize the new implementation structures. However, this Act has not yet been promulgated. Spatial Strategies are backed by statutory instruments in other countries as well, including Germany (Federal Spatial Planning Law, 1965), Korea (Framework Act on National Territory, 2002) and Malaysia (Town and Country Planning Act 1976, revised in 2001).

At minimum the law for BSS institutionalization should cover:

- Composition (ex-officio, appointed and coopted members), function and powers of the new structures i.e. Spatial Planning Board/Council, Spatial Planning Authority and departmental nodes;
- Responsibilities of GoB Line Departments toward these structures, e.g. supervisory responsibilities of the Secretary, P&D where the BSS Support Unit will be housed;
- Governance of monetary inflows and expenditure from the Spatial Development Fund;
- Legal standing of spatial plans produced under the BSS, for instance city master plans;
- Provision for Rules to be framed by GoB to govern operational management.

7 Components of The Balochistan Spatial Strategy

The final strategy can entail the following segments:

Baseline Report: Balochistan 2022 (A data & maps compilation of all sectors of the province): The data collected, both spatial and non-spatial would be an excellent tool to prepare the baseline picture of province, both in maps, as well as numbers. Several sectoral, district wise or department wise maps and atlas and data books can be published for relevant stakeholders on where the province stands on key development indicators. An example of one of such products is the 'Punjab Cities Atlas', that shows the growth of 50 largest cities over a 20 years period, based on data collected and analyzed.

Vision 2047 (can be developed for 25 years, 2022 – 2047): A strategy is defined as a plan of action to reach from where the province stands to a desired situation in the future. The baseline report mentioned above (Balochistan 2022), will document the current situation of development in the province. A vision document is also needed. Via a thoroughly consultative process, the development team can chalk out a vision for the future of province. A suggested timeline is 25 years, to coincide with the 100th birthday of Pakistan.

Core Strategy: Based on the current scenario and vision 2047, consultants and PMU can develop a core strategy. Core strategy will be the backbone of the whole exercise. This will have a number of pillars, upon which the strategic direction would be set, to guide various investments in the next couple of years. This core strategy and its pillars will be based on certain principles of development and will need to be realistic, considering the financial, human and technical resources available. However, the strategy for a real change will need to set some ambitious targets, to be revised periodically, such as every five years.

Sectoral Strategies: In addition to the core provincial strategy, there can be a number of sectoral strategies, for example for transport and connectivity, urban development, industrial development, agricultural development etc. Every sector, based on the baseline data and consultation with the stakeholders (both public as well as private sector), every sector will have their own targets (long term as well medium term), and strategies to achieve those targets. These sectoral strategies can be based on spatial data after assessment of the comparative advantage of spatial location, aimed at achieving the most optimum output.

Decision Support Systems for Sectoral planning (DSS) : As described above, there can be a couple of DSS developed for some of the key departments and sectors, that would be subsets of the overall provincial DSS. Such a system is just a support system and the decision can be made by the competent authority / forum. The DSS will provide help and assistance in providing:

o   Real time integrated data for not only the sector concerned, but also for the allied sectors. For example, low enrollment rate in many tehsils is not due to lack of school facilities, but for frequent incidence of diarrheal diseases, that causes dropouts. Thus, a decision to construct more schools based on low literacy rate would be futile. On the next level, frequent diarrhea is not because of lack of health facilities, but usually is due to lack of clean drinking water or good sanitation facilities. Thus, low enrolment is linked to a sector, which apparently looks unrelated. This kind of integrated data sets would improve the decisions regarding future investments in developments schemes.

- An advanced level of DSS, in addition to the provision of real time data, can also provide help in predictive and prescriptive data analytics by building scenarios, providing options and sensitivity analysis, towards an optimum investment decision.

8   Next Steps

The GoB may take the following measures to begin developing the BSS.

1. Preparing the Data Development Framework – As described in Section 5, the P&D Department will first develop a framework to guide data collection, storage and analysis.

2. Mapping and Collection of Secondary Data – The first step is to map sources of data that are already available and can become the first building block of the spatial database. This includes data from the census, PSLM Survey, Labor Force Survey, Census of Manufacturing Industries, Multiple Indicator Cluster Survey and the range of sectoral data collected by the Bureau of Statistics, GoB, which can be collected and reworked into standardized analyzable datasets to form the basis for the DSS.

3. Collecting primary data – Where required, primary data will need to be collected through on-site visits. This can be done by tasking field formations of relevant line departments, as well as local governments and authorities. Their work may be supplemented by private contractors engaged for this purpose.

4. Conducting a Spatial SWOT – With access to a sufficiently broad range of primary and secondary data, a basic spatial profile of the province will begin to emerge in terms of geography, economy, environment and demography. Based on this information broad strengths, weaknesses, opportunities and threats can be identified.

5. Developing Spatial Vision and Objectives – The objectives proposed earlier in Section 1.2.2 will need to be revisited and refined in light of the Spatial SWOT and specific, objectively measurable and verifiable targets should ideally be developed. These higher-level results will guide all subsequent work on the BSS.

6. Developing policies, programs and actions – Once the expected results are clearly defined, GoB can work backward to identify the specific policies, programs and actions that need to be set in place to achieve those results over the life of the BSS. The outputs will be the Core Strategy described in Section 5, as well as Sectoral Strategies to deliver policy outcomes and targets in health, education and other prioritized sectors.

7. Localizing Spatial Planning – As a final step, the overall provincial level core strategy will need to be taken down to the local level i.e. divisions and districts. Local spatial plans will need to be developed by local governments and authorities that conform to the broad parameters set in the Core Strategy, while taking into account local contextual factors. These will cover land-use, transport, environment, infrastructure priorities, among other variables.

In parallel with these steps, the GoB will need to design and manage initiatives required for:

- Ongoing consultations with public and private sector stakeholders at provincial and sub-provincial levels;
- Capacity building of government officials that are part of the institutional architecture of the BSS;
- Change management to accompany the integration of BSS with development planning, ADP formulation and project appraisal processes;

In terms of initial steps, the GoB may move to set up the institutional architecture for the BSS to drive the process forward. This will begin with the development of a development of a PC-I to find resources to

provide the human and physical resources to set up the PMU and engage consultants for strategy development and review. In the interim, the Spatial Planning Board/Council may be constituted through a formal notification by the GoB. In the medium term, the entire architecture should be reflected in a dedicated provincial law (described in Section 6.5).

9 Annex – A: PMU Structure for Punjab Spatial Strategy

The structure for Punjab's PMU for PSS included the following key positions.

1. Project Director
2. Project Manager
3. Sr. Manager Finance/Accounts
4. Sr. Procurement Specialist
5. Communications Specialist
6. Sr. Manager Internal Audit
7. Support Staff

In addition, the project also included the following international consultancies:

- International Firm for Punjab Spatial Strategy & other components (while engaging an international firm was proposed in the project document, it was never engaged and the work was completed in-house by the Urban Unit, under the guidance & supervision of two international and one national consultant)
- Four consultants (two local, two international) selected by the World Bank and Urban Unit to serve as the panel of experts

Moreover, a counterpart Team of specialists was hired at the Urban Unit to prepare TORs, review consultants' report, collect and analyze data inventory, and developing Capacity building programs etc:

1. Sr. Specialist, Urban Planning
2. Sr. Specialist, Economics
3. Sr. Specialist, SEZ
4. Sr. Specialist, Institutional Development
5. Sr. Specialist, Infrastructure Development
6. Sr. Specialist, Capacity Development
7. Sr. Specialist, HRD
8. Sr. Specialist, GIS
9. Sr. Specialist, GIS Development
10. Sr. Specialist, Environment
11. Sr. Specialist, Transportation
12. GIS Managers for Head Office as well as Divisions

10 Annex - B: Data Acquisition Guidelines

10.1   A Unique Identification Code:

This coding is most critical, as in future all data sets could be linked to individual assets, without any trouble. This is like unique CNIC # that we have for individuals. A methodology for assigning unique code should be devised, that should be logical.

1.   The code should have:
     o   **Locational attributes** such as Province / District /Tehsil code (PBS has already assigned these codes for census purposes)
     o   For lower levels, like Mauza / Village / Deh etc in rural areas, the Board of Revenue usually has some coding (Hadbast number etc)
     o   In urban areas the Dept could assign some mechanism / methodology of using City, Mohhala, street code etc.

2.   **Type of asset code** such as road / bridge etc.

10.2 Spatial Representation:

Use proper spatial representation for an asset
   a.   Roads should be represented using **line f**eature
   b.   Agriculture land should be represented using **polygon feature**
   c.   School / Health or other facilities can be represented using **point feature**

10.3 Location/accessibility related attributes

Location/accessibility related attributes should be calculated using GIS functions after geo-tagging exercise. The proposed way would be more accurately and efficient. _Example question_: Is there any source of pollution within 10 m radius of the catchment (e.g. animal breeding, cultivation, roads, industry etc.)? This type of question will be hard to answer in the field. GIS software can be used to calculate these values.

10.4   A progress monitoring dashboard

A progress monitoring dashboard should also be developed to monitor survey progress, that also ensures accuracy & improves quality of data.

10.5 SOPs:

Standard operating procedures for spatial data capture should be defined - spatial data editing module may be introduced to place location at the center of the building. GPS capture might be from the road.

10.6 Digitization of Existing Paper Maps:

Use of existing maps of Irrigation / Communication & Works or other departments could be utilized to digitize canals & Roads etc. - Smart phone based location capturing of such assets might be difficult

and time consuming. Canals and Roads are usually fixed assets for decades and alignment remains same.

10.7 Data Updating Mechanism:

The software being developed for geo-mapping / tagging should have an **admin panel** to allow correction / deletion / updating. Rather than a one-time effort, departments should be trained to keep the assets database updated. Institutional arrangement is also required to do so.

10.8 Training manual

Training manual should be prepared and shared with the Enumerators. The manual should not only contain the instructions to use the app but also guidance for each question of the questionnaire.

	Balochistan Spatial Strategy 2020 - 2047			
	Geo Spatial Data layers needed for developing the Strategy			
	Theme	**Layers**	**Status**	**Remarks**
1	**Satellite Image**	Satellite Image 0.46m		Digital Globe base map Standard Product
				2020, 2015, 2010, 2005 & 2000
2	**Administrative Boundaries**			
		Province		Survey Gen of Pakistan is the authentic boundaries
		Division		same
		District		same
		Tehsil		same
		Mauza		Board of Revenue might have these, developed under Land Records
		UCs/MCs		latest boundaries
		Census Blocks	Available with BOS	
		Villages		
3	**Land Cover**			
		Built-up		
		Agriculture		
		Open Land	Can be Developed from Landsat VIII Imagery (15m)	
		Water Bodies		
		Forest		
		Desert		
4	**Cities & Urban Areas**	Built up areas		
		Commercial & Residential		
		Open spaces		
		Road network (major)		
		Slums & K Abadis		

	Balochistan Spatial Strategy 2020 - 2047			
	Geo Spatial Data layers needed for developing the Strategy			
	Theme	**Layers**	**Status**	**Remarks**
5	**Transportation**			
		Motorways		NHA has for entire Pakistan
		National Highways		NHA has for entire Pakistan
		Intercity Roads		Provincial Roads Dept.
		Major Roads		Same
		Bus Terminals		Provincial Transport Dept.
		Truck Adda s		
		Railway Line		Railways GIS section has this data
		Railway Station		Same
		Airports		need to be marked.
		Dry Ports		
6	**Utility Network**			
		Electricity Network		WAPDA
		Sui Gas Network		SSGL
		Telecom Network		PTCL + PTA (Even Towers data is available)
7	**Topography**			
		Digital Evaluation Model (DEM)		GIS team would need to develop.
		Hillshad		
		Slope		
		Aspect		
		Contours		
		Watershed		
8	**Irrigation**			
		Rivers		

	Theme	Layers	Status	Remarks
		Canals/Channels		
		Dams		
		Barrages		
		Small dams		
		Lakes & Water bodies		
9	**Agriculture**	Arable area		
		Individual Crops		
		Forests		
10	**Environment**	National Parks		
		Wildlife Sanctuaries		
		Game Reserves		
		Ramsar Sites		
11	**Public Services**			
		Health Facilities		Private facilities included
		Education Facilities		Including Private Facilities
12	**Meteorological**			
		Temperature		This has to be district wise
		Rainfall		
		Precipitation		
13	**Industrial**			
		Industrial Units		
		Industrial Zones		

<div align="center">
Balochistan Spatial Strategy 2020 - 2047

Geo Spatial Data layers needed for developing the Strategy
</div>

		Balochistan Spatial Strategy 2020 - 2047			
		Geo Spatial Data layers needed for developing the Strategy			
	Theme	**Layers**	**Status**	**Remarks**	
14	**Block Level Land use (Built-up)**			Blocks of Buildup area received from BOS will be classified in the lab using secondary data. Later these blocks will be verified through field	
		Residential			
		Commercial			
		Industrial			
		Mixed Use			
15	**Miscellaneous**	Banks			
		Mobile banking Shops			
		Tourism Spots			

11 Annex - C: Balochistan Spatial Strategy: Cost Estimates

11.1 Summary

<table>
<tr><th colspan="6">Balochistan Spatial Strategy</th></tr>
<tr><th colspan="6" align="left">Project Management Unit Cost: Human Resource</th></tr>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">Item</th><th rowspan="2">Cost / year</th><th>2020-21</th><th>2021-22</th><th rowspan="2">Total (Rs.)</th></tr>
<tr><th>Y1 (Rs.)</th><th>Y2 (Rs.)</th></tr>
<tr><td>1</td><td>PMU Cost</td><td></td><td>52,020,000</td><td>57,222,000</td><td>**109,242,000**</td></tr>
<tr><td>2</td><td>Data Development</td><td></td><td>122,500,000</td><td>122,500,000</td><td>**245,000,000**</td></tr>
<tr><td>3</td><td>Review Consultants</td><td></td><td>13,500,000</td><td>13,500,000</td><td>**27,000,000**</td></tr>
<tr><td>4</td><td>Strategy Dev Consultants</td><td></td><td>115,080,000</td><td>115,080,000</td><td>**230,160,000**</td></tr>
<tr><td></td><td></td><td></td><td>**303,100,000**</td><td>**308,302,000**</td><td>**611,402,000**</td></tr>
</table>

11.2 Strategy Development Consultants

<table>
<tr><th colspan="7">Balochistan Spatial Strategy</th></tr>
<tr><th colspan="7">Strategy Development Consultants</th></tr>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">Item</th><th rowspan="2">Unit / year</th><th rowspan="2">Unit Price</th><th rowspan="2">Price / year</th><th>2020-21</th><th>2021-22</th><th rowspan="2">Total (Rs.)</th></tr>
<tr><th>Y1 (Rs.)</th><th>Y2 (Rs.)</th></tr>
<tr><td></td><td>**International Experts**</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>1</td><td>Urban and Regional Planner</td><td>6</td><td>2,100,000</td><td>12,600,000</td><td>12,600,000</td><td>12,600,000</td><td>**25,200,000**</td></tr>
<tr><td>2</td><td>Urban Economist</td><td>6</td><td>2,100,000</td><td>12,600,000</td><td>12,600,000</td><td>12,600,000</td><td>**25,200,000**</td></tr>
</table>

	SEZ/Industrial Zone Specialist	3	2,100,000	6,300,000	6,300,000	6,300,000	**12,600,000**
3	Infrastructure Finance Specialist	3	2,100,000	6,300,000	6,300,000	6,300,000	**12,600,000**
	Local Experts			-	-	-	**-**
4	Urban and Regional Planner	12	700,000	8,400,000	8,400,000	8,400,000	**16,800,000**
5	Data Analyst	12	600,000	7,200,000	7,200,000	7,200,000	**14,400,000**
6	Urban Economist	12	600,000	7,200,000	7,200,000	7,200,000	**14,400,000**
7	Environmentalist/Ecologist	3	600,000	1,800,000	1,800,000	1,800,000	**3,600,000**
8	SEZ/Industrial Zone Specialist	6	600,000	3,600,000	3,600,000	3,600,000	**7,200,000**
9	Infrastructure Finance Specialist	6	600,000	3,600,000	3,600,000	3,600,000	**7,200,000**
10	Institutional Development Specialist	6	600,000	3,600,000	3,600,000	3,600,000	**7,200,000**
11	Legal Expert	6	600,000	3,600,000	3,600,000	3,600,000	**7,200,000**
12	Geologist/Natural Resource Specialist	3	600,000	1,800,000	1,800,000	1,800,000	**3,600,000**
13	Project Manager	12	300,000	3,600,000	3,600,000	3,600,000	**7,200,000**
	Total HR Cost (60%)			**82,200,000**	**82,200,000**	**82,200,000**	**164,400,000**
	Firm Cost @40% of HR cost				**32,880,000**	**32,880,000**	**65,760,000**
	Grand Total Cost of Consultancy				**115,080,000**	**115,080,000**	**230,160,000**

11.3 Review Consultants

<table>
<tr><th colspan="8">Balochistan Spatial Strategy</th></tr>
<tr><th colspan="8">Review Consultants to Support the PMU in Review of Consulting Firm's Work (Inc TORs Development)</th></tr>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">Item</th><th rowspan="2">Unit / year</th><th rowspan="2">Unit Price</th><th rowspan="2">Price / year</th><th>2020-21</th><th>2021-22</th><th rowspan="2">Total (Rs.)</th></tr>
<tr><th>Y1 (Rs.)</th><th>Y2 (Rs.)</th></tr>
<tr><td>1</td><td>International Consultants 1</td><td>30</td><td>125,000</td><td>3,750,000</td><td>3,750,000</td><td>3,750,000</td><td>7,500,000</td></tr>
<tr><td>2</td><td>International Consultants 2</td><td>30</td><td>125,000</td><td>3,750,000</td><td>3,750,000</td><td>3,750,000</td><td>7,500,000</td></tr>
<tr><td>3</td><td>National Consultant Data Dev</td><td>50</td><td>50,000</td><td>2,500,000</td><td>2,500,000</td><td>2,500,000</td><td>5,000,000</td></tr>
<tr><td>4</td><td>National Consultant Strategy Dev</td><td>50</td><td>70,000</td><td>3,500,000</td><td>3,500,000</td><td>3,500,000</td><td>7,000,000</td></tr>
<tr><td colspan="2">Total</td><td></td><td></td><td>13,500,000</td><td>13,500,000</td><td>13,500,000</td><td>27,000,000</td></tr>
</table>

11.4 Data Development Cost

<table>
<tr><th colspan="7">Balochistan Spatial Strategy</th></tr>
<tr><th colspan="7">Data Development Cost</th></tr>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">Item</th><th rowspan="2">Unit / yr</th><th rowspan="2">Unit Price</th><th rowspan="2">Price / year</th><th>2020-21</th><th>2021-22</th><th rowspan="2">Total (Rs.)</th></tr>
<tr><th>Y1 (Rs.)</th><th>Y2 (Rs.)</th></tr>
<tr><td>1</td><td>Satellite Imagery</td><td>50,000,000</td><td>50,000,000</td><td></td><td>25,000,000</td><td>25,000,000</td><td>50,000,000</td></tr>
<tr><td>2</td><td>ArC GIS Licenses</td><td>30,000,000</td><td></td><td></td><td>30,000,000</td><td>0</td><td>30,000,000</td></tr>
<tr><td>3</td><td>Data Center</td><td>10,000,000</td><td></td><td></td><td>5,000,000</td><td>5,000,000</td><td>10,000,000</td></tr>
<tr><td>4</td><td>Hardware</td><td>10,000,000</td><td></td><td></td><td>5,000,000</td><td>5,000,000</td><td>10,000,000</td></tr>
</table>

5	Data Collection	100,000,000			40,000,000	60,000,000	100,000,000
6	Data Processing	20,000,000			10,000,000	10,000,000	20,000,000
7	Data Analytics (DSS)	25,000,000			7,500,000	17,500,000	25,000,000
		245,000,000			**122,500,000**	**122,500,000**	**245,000,000**
	Notes: This whole component would be outsourced to a firm						

11.5 Project Management Unit Cost

Project Management Unit Cost: Human Resource							
Sr. No.	Position	No of Positions	No of Years	Salary Per Month (Rs.)	2020-21 Y1 (Rs.)	2021-22 Y2 (Rs.)	Total (Rs.)
1	Project Director	1	3	500,000	6,000,000	6,600,000	12,600,000
2	Project Manager	1	3	400,000	4,800,000	5,280,000	10,080,000
3	Specialist Urban Planning	1	2	400,000	4,800,000	5,280,000	10,080,000
5	Sr. Specialist Economics	1	2	400,000	4,800,000	5,280,000	10,080,000
7	Specialist Legal	1	2	400,000	4,800,000	5,280,000	10,080,000
8	Specialist Institutional Development	1	2	300,000	3,600,000	3,960,000	7,560,000
10	Specialist Infrastructure Development	1	2	300,000	3,600,000	3,960,000	7,560,000
11	Specialist GIS	1	2	400,000	4,800,000	5,280,000	10,080,000

13	Specialist Transportation / communications	1	2	300,000	3,600,000	3,960,000	7,560,000
17	Specialist Communications	1	2	300,000	3,600,000	3,960,000	7,560,000
21	Specialist Procurement	1	2	200,000	2,400,000	2,640,000	5,040,000
22	Sr. Manager Finance/Accounts	1	3	150,000	1,800,000	1,980,000	3,780,000
23	Sr. Manager Internal Audit	1	3	150,000	1,800,000	1,980,000	3,780,000
24	Sr. Analysts (UP, Finance, Economics, Communications, Transport, IT, etc.)	10	2	60,000	720,000	792,000	1,512,000
26	Support Staff	20	3	35,000	420,000	462,000	882,000
27	Drivers	8	3	40,000	480,000	528,000	1,008,000
					52,020,000	**57,222,000**	**109,242,000**

Project Management Unit Cost: Operating Cost						
Sr. No.	Position	Unit / yr	Unit Price	Price / year	2020-21 Y1 (Rs.)	2021-22 Y2 (Rs.)	Total (Rs.)
1	office rental	12	150,000	1,800,000	1,800,000	1,980,000.0	3,780,000
2	electricity	12	100,000	1,200,000	1,200,000	1,320,000.0	2,520,000
3	Miscellaneous Utilities	12	50,000	600,000	600,000	660,000.0	1,260,000
4	Wifi	12	100,000	1,200,000	1,200,000	1,320,000.0	2,520,000
5	Stationery & printing	12	50,000	600,000	600,000	660,000.0	1,260,000

6	Car purchase	2	2,500,000	5,000,000	5,000,000		5,000,000
7	Car rental	2	125,000	250,000	250,000	275,000.0	525,000
8	POL	12	100,000	1,200,000	1,200,000	1,320,000.0	2,520,000
9	Office furniture & Miscellaneous	2	500,000	1,000,000	1,000,000		1,000,000
	Total			**12,850,000**	**12,850,000**	**7,535,000.0**	**20,385,000**

Notes: For a two years project, PMU costing is needed for 3 years, as we need a couple of months preparation & some time for closing and transition. Costing for year3 is limited and only essential positions retained and operating expense reduced to half.

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