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**Title:** Strengthening the Statistical System for National Development: A Case Study of Pakistan

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# Strengthening the Statistical System for National Development: A Case Study of Pakistan

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## Abstract

An integrated, updated, digitized, and comprehensive statistical system is the core of a country's development. Such a system helps to determine population size, poverty levels, employment, health, education, and other resources (human and non-human). Pakistan's statistical system is deficient in many core areas; therefore, it lacks reliability and remains weak. This weakness results in ineffective planning and mismanagement of resources. The current study brought forth some of the weak areas of the statistical system by conducting a review of grey literature. It suggested engagement of local institutions as well as their digitization and integration, creating a single database for accuracy and transparency for efficient national resource utilization.

**Keywords:** national database and registration authority integration, numberdar-chowkidar resource management, public policy, statistical system

## Introduction

Evidence-based policymaking necessitates an integrated, digitized, and comprehensive statistical data infrastructure. This comprehensive and integrated data helps the government in efficient and effective policy formulation and implementation. It provides population demographics, including social and economic trends, educational and health infrastructure, the number of school-going children, and out-of-school children, to name a few (Anderson, [2017](#)). Accurate and up-to-date data enables the governments to identify income groups for whom policies are formulated, reduce inequalities, and improve citizens' quality of life (Soldani et al., [2024](#)). Developing countries, such as Pakistan, unlike developed countries, are confronted with an integrated and updated statistical system that can realistically show the socio-economic development of the country.

The statistical system of Pakistan suffers from gaps. These include updated data, lack of digitization, and the disconnect of grassroots structures, for instance the Numberdar and Chowkidar system with the



National Database and Registration Authority (NADRA) system. These gaps and deficiencies result in ineffective policy formulation, implementation, resource allocation, monitoring, and feedback, which are necessary for achieving policy goals (NADRA, [2025](#)). Therefore, the study argued that outdated statistics have resulted in strategies that are deficient in achieving policy goals. This leads towards the wastage of billions of rupees every year that are being spent on unsound development strategies, limiting the efficacy of government development programs. Thus, agriculture, health, and education are the most affected areas.

The study argued that an integrated, comprehensive, dependable, and strong statistical infrastructure is needed to understand the challenges of the country while assessing the needs of the population and accordingly designing programs for desirable outcomes. Such a system is not only required for designing policies but also to meet Sustainable Development Goals (SDGs) and the prosperity of the citizens. To understand the gaps in the statistical system of Pakistan, the grey, including government reports, international organizations' reports, and some scholarly articles from 2017 to 2022 were reviewed. After the identification of challenges, recommendations were made to address the gaps and challenges.

The rest of the study is organized as follows: Section 2 presents literature review which highlights the challenges of Pakistan's statistical system. Section 3 discusses the methods, section 4 presents findings which also discusses the proposed measure, and the last section concludes the study.

## Literature Review

Grey literature and scholarly articles were reviewed under the following themes:

### Agriculture Statistics

The agriculture sector is the core of Pakistan's economy. The inadequacy of the statistical system contributes to the sector's inefficiency. Reliable crop data is frequently unavailable, leaving farmers vulnerable to losses and hindering policymakers' ability to assess productivity trends. Profitability and losses by crop largely remain undocumented, resulting in uncertainty for farmers and markets (Key, [2019](#)). There is a need for reforms in agricultural statistics to develop and effectively implement strategies in order to improve food security, enhance exports, and support

rural livelihoods. While updated statistical data is important for policymaking and implementation, it is also argued that policies are also flustered due to wrong political decisions. However, here the statistical data was focused.

### **Educational Discrepancies**

A country's education sector is important for its human resource (HR) development. If we look into the education sector, poverty, and resource utilization, we would find that statistics are not updated. For instance, the number of out-of-school children is often repeated as 25 million. Since the population is growing, the number should increase if the school infrastructure is not added. This is because the number of school-going versus non-school-going children and out-of-school children is neither accurately updated nor is the addition of new school infrastructure updated (UNICEF, [2024](#)). This creates a serious problem for policymakers, analysts, and donors to identify regions with the greatest need for intervention in order to develop effective educational programs. Dependable data is necessary to improve enrollment, reduce dropouts, and achieve literacy goals, which remains fragmented and ineffective.

### **Reliable Population Data**

A related challenge is the high population growth in Pakistan. The population census takes place after 10 years, which may not adequately deal with the challenges of a growing population. Thus, population estimates are not very reliable. This unreliability of population data affects resource allocation, which at times is misdirected. This misdirected resource allocation exacerbates regional disparities (Bhattacharyya et al., [2020](#)).

### **Mismanagement of Funds**

It is noteworthy that due to weak accountability, outdated methods of data collection, and less digitization of data, the money allocated to the government departments responsible for data collection often goes waste (Shava et al., [2025](#)). This results in inefficient utilization of money as well as erosion of public trust. Countries that have digitized and integrated data collection benefit from it by making and implementing robust policies for better outcomes.

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## Unemployment and Poverty Statistics

Targeting deprived groups for income support requires updated data to understand if low-income groups have moved out of poverty or if more people have fallen under the poverty line. In Pakistan, these figures are unknown. Thus, many vulnerable groups remain out of welfare programs (Pu et al., [2024](#)).

## Resource Utilization

The process of securing common pool resources, such as water, forests, and air pollution remains inadequate, which makes the management of these resources difficult. Additionally, the number of privately operating tube wells also remains a question. Forests are cut down and the exact data is unknown. It is both a governance challenge as well as a data collection issue (Sharif, [2025](#)). This lack of reliable information hinders effective planning, sustainable management, and equitable distribution of resources. Thus, reliable statistics are necessary for resource degradation and securing the natural resources.

## Health Sector Gaps

Health is another important sector, which is underperforming due to the gaps in statistical data. Health-related data, such as morbidity and disease prevalence, particularly in rural areas, remains uncollected and underreported. This is detrimental to effective policy planning and implementation (Naz et al., [2023](#)). This also results in inadequate resource allocation for preventable diseases and delayed response to outbreaks.

## Methods

A systematic literature review was conducted, including government reports and reports from international organizations. It covered the time period from 2017-2023 (Chigbu & Ihechu, [2023](#)). A comprehensive literature review identifies research gaps and shows pathways in the identification of areas that need attention (Heston, [2024](#)). Altogether 60 sources, mainly grey literature and a few scholarly articles, were accessed using keywords, such as Pakistan statistical system, resource allocation, employment data, poverty analysis, evidence-based policy-making, Numberdar and Chowkidar system, and National Database and Registration Authority (NADRA). In this process, those areas were identified that needed to be improved.

## Findings

The literature review helped identify the following areas for reforming the statistical system of Pakistan.

### Numberdar's Role

The Numberdar is a traditional local-level institution. The literature showed that Numberdar is very crucial at the village level. Traditionally, the Numberdar was responsible for recording village-level data, such as population data, number of animals, land resources, agriculture productivity, and natural resources. Over the years, this institution has remained disconnected with the mainstream data collection organizations and continues to collect and store data manually. This results in error and inefficiency. To reform the data collection at the Numberdar and village level, it needs to be digitized and integrated with the NADRA system. To reform and upgrade the Numberdar system, fingerprint scanners and photographs at the data entry point would help in establishing the credibility and reliability of the data. It would also reduce duplication of records. Moreover, a unified, grassroots local-level data would empower local governance and provide policymakers with timely, updated, and reliable data for effective planning and development.

### Chowkidar's Role

Chowkidar is another local grassroots level institution, responsible for watch and ward in the village. He is the kind of ears and eyes of the village. Apart from watch and ward and monitoring of events at the village level, he can be assigned to collect data on births, deaths, and disease outbreaks (Haq, [2021](#)). He can be a good support to Numberdar for recording, maintaining, and updating village-level data. The cooperation of the two village-level officials can ensure the recording of population changes in real time. However, the digitization of data through a mobile application connected to the NADRA system would make a seamless transfer of data. This, however, requires training of Chowkidars and Numberdars in digital use, data collection, and data transfer to the NADRA system.

### Resource Documentation

Local-level development, whether rural or urban, requires timely and reliable data. As noted earlier, the recording resources, such as trees, tube wells, livestock, and other natural and man-made resources are necessary

for sustainable development (Israr et al., [2017](#)). This data provides information on available resources, resource usage, and resource depletion, which helps determine the intervention needed to avoid resource depletion and ensure sustainability.

Thus, documentation of resources at the local level not only strengthens local governance but also improves the quality of data, which is real-time and updated. The reliance on outdated surveys is reduced. The resource data at the local-level produces real-time data and reduces reliance on outdated surveys and fragmented reports. However, the resource data should be digitized and linked to the national database. The data collection needs to be standardized and integrated to national statistical framework. These records are useful for designing targeted agriculture policies, monitoring environmental changes, equitable resource distribution, and empowering communities.

### **Integration with NADRA**

One of the significant aspects of reforming the statistical system of Pakistan is that all local-level data needs integration with the NADRA system. Integrating local-level population data, resource data, health, education, employment, and poverty data with NADRA eliminates duplication and improves reliability and dependability of data for policymakers, scholars, and analysts (NADRA, [2025](#)).

A centralized database reduces inconsistencies overlap across government organizations, which increases data verifiability and tracking and ensures that data is not manipulated or misused. As noted in preceding paragraphs, it helps policymakers to monitor demographic changes, allocation of resources, and effective development planning with greater confidence.

### **Permanent Staff Allocation**

While Numberdars and Chowkidars' offices in rural areas are necessary, in urban areas, however, permanent staff at the ward and Union Council is the need for making the statistical system robust. At present, data collection tasks are assigned to temporary and ad hoc staff who are less accountable. This results in inefficiency and inconsistencies (Pakistan Bureau of Statistics, [2020](#)).

Assigning permanent staff to each ward and Union Council would

ensure continuity, proper monitoring, and reliability of statistical responsibilities. Permanent staff can become more familiar with the local population and resources, which would allow them to maintain accurate and updated data. Permanent staff can also coordinate better with Numberdars and Chowkidars which would help in developing integrated data collection network. This staff along with Numberdars and Chowkidars, can be provided training in digital tools and integration of data with the NADRA system, which would increase the credibility of data.

### **Daily Monitoring Teams**

In addition to the permanent staff, daily monitoring teams at the operational level are vital for creating a reliable statistical system in Pakistan. These teams are assigned to monitor the entry of real-time data on birth, death, employment, healthcare services, education enrolment, and other resources (National Institute of Health, [2025](#)).

Monitoring teams are responsible for ensuring that data is regularly and accurately updated. This helps in reducing time for the national survey and real-time data, which is necessary for immediate decision-making in government. Real-time data allows timely response to disasters, disease outbreaks, school dropouts, poverty trends, and unemployment, to name a few. For better working of the teams, training in the use of digital tools, reporting, and connectivity with NADRA is required.

### **Accountability**

For effective compliance with rules, the accountability of staff is important. In Pakistan, this is a weak area that requires attention, and an accountability framework needs to be instituted. The accountability framework should incorporate compliance and non-compliance of updating data. For instance, if the data is not recorded, the staff responsible for updating should be held accountable according to the rules framed. Likewise, incentives for timely updating data and accuracy of data should be rewarded (Government of Pakistan, [2013](#)). Regular monitoring and accountability would also ensure discipline and integrity among staff and improve data accuracy and reliability.

### **Resource Tracking**

Accountability and resource tracking enable the system to ensure that development programs are in accordance with the increasing population's

needs. Thus, updated data and resource tracking in areas, such as education, healthcare facilities, and labor markets, help in tracking the gaps and provision of services where these are required (Aziz & Anwar, 2024). So, resource tracking helps identify the overcrowded classrooms, low enrollment in schools, gaps in healthcare facilities, poverty-prone areas, and resource waste. It has been observed that establishing a regular approach to resource tracking helps ensure balanced development in rural and urban planning and resource allocation. Sound resource tracking enables better service provision, adequate employment strategy, and equitable development in the country.

### **Discussion**

A systematically-aligned, integrated, and comprehensive statistical database is the core requirement to improve governance as well as development planning and equitable resource allocation. It identifies the areas where resources are unevenly distributed. Therefore, NADRA needs to be a comprehensive platform of database and should not just confine to basic population demographic registration. However, it should include records of qualification of population, skills, and employment records. Integrating grassroots data would present a holistic view of the country's human resources as well as other resources. This integration would improve not only social planning but economic and resource planning as well, particularly human resource data would help in identifying the skills and jobs for the population. The integrated data would also reduce duplication and data overlapping.

Aligning the local traditional system of Numberdar and Chowkidar and monitoring teams with the NADRA system would integrate the present fragmented statistical system which might continually update the national record of population and resources in the country. Furthermore, it would target welfare and development programs to the rightful recipients transparently and efficiently. The minimization of manual entries and automated updates from educational institutions, certification bodies, and training institutions would improve the credibility and reliability of the data. Hence, it would help in the effective mapping of the workforce and connect them effectively to the respective labor markets.

At present, the job applicants have to undergo a frustrating experience of repeatedly submitting same documents and forms etc for the admissions

and verification processes, resulting in delays and resentment (Fatima, [2025](#)). Integrations of verified qualifications, skills, and other employment records to NADRA would save applicants from repetitive work. This would also help reduce redundant procedures, corruption, and delays. The universities and employers should have access to the HR data for ease of procedures (Cheema et al., [2024](#)).

It is noteworthy that young individuals, despite holding degrees from accredited universities and institutions, are required to sit for various tests, which is a waste of time and resources (Malik, G. A., [2014](#)). Therefore, a centralized and unified database of verified degrees and certifications would allow access to verified qualifications and third-party validation. Such reforms would not only improve efficiency but also ensure trust in the recruitment and admission processes.

Updated and accurate population data is important for effective governance of the country. It is necessary for evidence-based policy formulation for fair distribution of resources (Sankoh, O., & INDEPTH Network and Partners, [2017](#)). It has been found that census data is not regularly updated, which results in unfair allocation of resources. Digital survey, use of GIS, biometric verification, and integrations with NADRA would help in planning urban and rural development and fair distribution of resources.

In addition to population data, sectoral data is important as well, for instance, in the agriculture sector, the regular recording of crop yields, input cost, and market prices is lacking, which leaves farmers to uncertainty and vagaries of chance (Malik T., [2014](#)). A well-structured and integrated statistical system, therefore, disseminates information to farmers. This helps them make informed decisions, reduce losses, and make their businesses profitable. Integration of this data would also make it more transparent and allow government support to reach areas where it is most needed. This may also improve rural livelihoods and food security.

In the same manner, better healthcare outcomes are dependent on reliable and updated region-specific data. Systematic tracking of disease prevalence or pandemic helps make targeted interventions, which include resource allocation, provision of medical facilities, and better healthcare planning (Schwalb et al., [2024](#)). A digitized and nationally-integrated healthcare system is also more accountable and resilient.

Similarly, the effectiveness of education sector is also dependent on reliable and continually updated data. Such data is useful in addressing literacy, dropout rate, and regional disparities (Asif, [2021](#)). Accurate digitized, integrated educational data is useful for better educational planning for schools, teachers' training, and other resources. Integration of educational data into the national statistical system would help in tracking progress and ensure that all children are accounted for.

Furthermore, poverty and employment/unemployment data is equally important for designing welfare programs and job creation opportunities. Outdated data on income levels and unemployment may result in poor targeting of the income support program that may not reach the vulnerable population (Zaman, [2025](#)). However, a digitized and integrated data on poverty and unemployment would help in identification of target population, as well as support inclusive policy of social protection and skill development.

It is argued that reliable and continually updated data is necessary for ensuring effective governance. It has been observed that in Pakistan, fragmented data has been one of the causes of mismanagement, project overlap, and misuse of public money (Zaidi, [2023](#)). Therefore, an integrated statistical system is the need of the day to reduce duplication of project and efficient utilization of public money, and monitoring of public policy implementation. This would further consolidate and integrate employment data, agriculture, educational, and healthcare data for better coordination (Hussain et al., [2023](#)).

Integration of the national data system is both a technical reform and a strategic necessity for effective governance, which helps policymakers develop well-coordinated, cross-sectoral interventions, and effectively align federal and provincial policies for desired outcomes (Mahmood et al., [2023](#)). Moreover, data integration would also make procedures simple for citizens, reduce procedural duplication, build citizens' trust on government, and achieve long-term socio-economic development of the country.

## Conclusion

An updated, integrated, digitized, and comprehensive statistical data infrastructure is necessary for formulating evidence-based policies and ensuring effective implementation. It helps the government to monitor policies and understand the policy outcomes, as well as redesign to further

improve outcomes. This data provides population demographics, such as occupation, employment/unemployment, and educational trends including the number of school-going children and out-of-school children. It also includes other features, for instance healthcare facilities and disease outbreaks.

Updated and reliable data helps governments to know about income groups for whom policies are formulated. Furthermore, it also reduces inequalities and improves the overall quality of life of citizens. Pakistan is faced with the challenge of a fragmented and unaligned statistical system that does not realistically show the socio-economic development of the country.

The statistical system of Pakistan suffers from multiple gaps, such as updated data, inadequate digitization, and the disconnect of local-level structures including the Numberdar and Chowkidar system with the NADRA system. These gaps have a deleterious impact on policy formulation, implementation, resource allocation, monitoring, and feedback, which are necessary for achieving policy goals. The study argued that outdated statistics have resulted in strategies that are deficient in achieving policy goals, leading towards loss of billions of rupees in different sectors, such as agriculture, education, and health.

### **Future Research Suggestions**

The current study suggested that an integrated, comprehensive, reliable, and continually-updated statistical system needs to be developed in order to meet the socio-economic challenges of the country, assess the needs of the population, as well as design programs for desirable outcomes. The most important aspect of this statistical system is reviving and linking the traditional Numberdar and Chowkidar system with the NADRA system, so that data is continually updated right from the grassroot level. This requires that the Numberdars and Chowkidars are trained in the digitization of data. Moreover, a robust system of accountability and monitoring should also be established.

#### **Author Contribution**

**Muhammad Razaq Aman Wattoo:** sole author

#### **Conflict of Interest**

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

### Data Availability Statement

Data supporting the findings of this study will be made available by the corresponding author upon request.

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