

DATA SHARING DOCUMENTS

BENAZIR-NATIONAL SOCIO ECONOMIC REGISTRY
(NSER)

This artifact contains all the NSER-Data sharing related documents



Following NSER data sharing documents of BISP are included in this artifact

1. Data Sharing Mechanism (**Section-A**)
2. Data sharing Protocols (**Section-B**)
3. Data Sharing form(**Section-C**)
4. Important Indicators And Profiling(**Section-D**)

Data Sharing Mechanism (Section-A)

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		Department	NSER

NSER Data Sharing Methodology

After launching of New NSER data in January 2022, data sharing requests from various organizations have increased manifold. To facilitate the requesting organizations, detailed steps entailing the entire process of data sharing are as under:

Step 1: Prior to submission of data sharing request, the requester should have overview of the data sharing protocols **(Section-B)**

Step 2: Formal Request with a cover letter from organization with following documents to be provided:

- i. Filled in data-sharing form **(Section-C)**
- ii. One pager concept note of the project/ program indicating the project design/scope and justification for utilization of the required data
- iii. Additional documents in case of Private organization/NGO/INGO
 - a. Proof of registration with Government of Pakistan (SECP/ Ministry of Interior/EAD) with covering letter on organization's letter head.
 - b. Brief objectives/working of organization on Organization's letter head

Step 3: Upon receiving the request from the organization, preliminary meeting will be convened to assess the requesting organization's data requirements followed by customization of required data.

Step 4: Approval of data-sharing request from "Data Sharing Committee" of BISP.

Step 5: If request is approved, a **Non-Disclosure Agreement (NDA)** between the requester and BISP will be signed. This document is to be signed by the Head of the organization/Project Director from requester and Director General (NSER) from BISP.

Step 6: MIS section will provide the data through APIs in consultation with the Technical team of the requesting organization. Technical details entailing API development/consumption are as under:

	<p style="text-align: center;">Government of Pakistan Benazir Income Support Program F-Block, Pak Secretariat, Islamabad</p>	Page #	2 of 2
		Department	NSER

The objective of **Cognitive Open API Architecture (CAA)** is to allow data sharing between different organizations, hence developing a consolidated database which will have comprehensive information about social protection and poverty alleviation. The API is based on **Open API Specifications** (swagger based) which uses **HTTP based GET, POST, PATCH AND UPDATE** requests. All the parameters are provided in the **JSON format**. The partner organization will only have to add reference to Open API and consume the API using standard HTTP **Request** and **Response** objects. API will take data in standard format (JSON) and will return standard codes as responses i.e., Successful Response (200), Unauthorized (401), Not Found (404) etc.

The API can **push** as well as **pull** the data. Organization will be able to request data from BISP but **in return they will also submit the data they possess to BISP**. For data sharing, BISP will provide every organization with user name and password. After **authentication** process, the client is authorized and presented with a unique JWT token along with its expiry time. The token is attached to every API method header. A **detailed cognitive API specification document** has been created to help organizations in smooth integration and consumption. It is important to note that all the communication between BISP and partner organizations will be done through a **secured VPN tunnel**.

Cognitive API has **staging** as well as **live** environment. Partner organizations will first consume Staging version when user account and password will be provided to them. Access to LIVE URL along with Live credentials will be provided once they have successfully consumed the staging environment. The provided API is **version based**. The initial version is V1.0 and if there is any changes, the organization will have link of V2.0 as well as V1.0. Deprecated endpoints may be removed when all organizations have shifted to the new version.

All the data that will be shared between the organizations through Cognitive APIs. The data is standardized through below **3 standard libraries**:-

- I. Programme Enrollment Library Standard
- II. Asset Delivery Reporting Standard
- III. Geo Library Standard

For **summary data**, **OBI** tool link will be provided to the organization which will allow the users to see high level reports. Bulk Data Downloader utility is a multi-threaded application which will download bulk beneficiaries' data through API taking quintile, province, divisions, districts and tehsils as input. Data for each tehsil will be saved in a separate file.

NSER Data Sharing Protocol

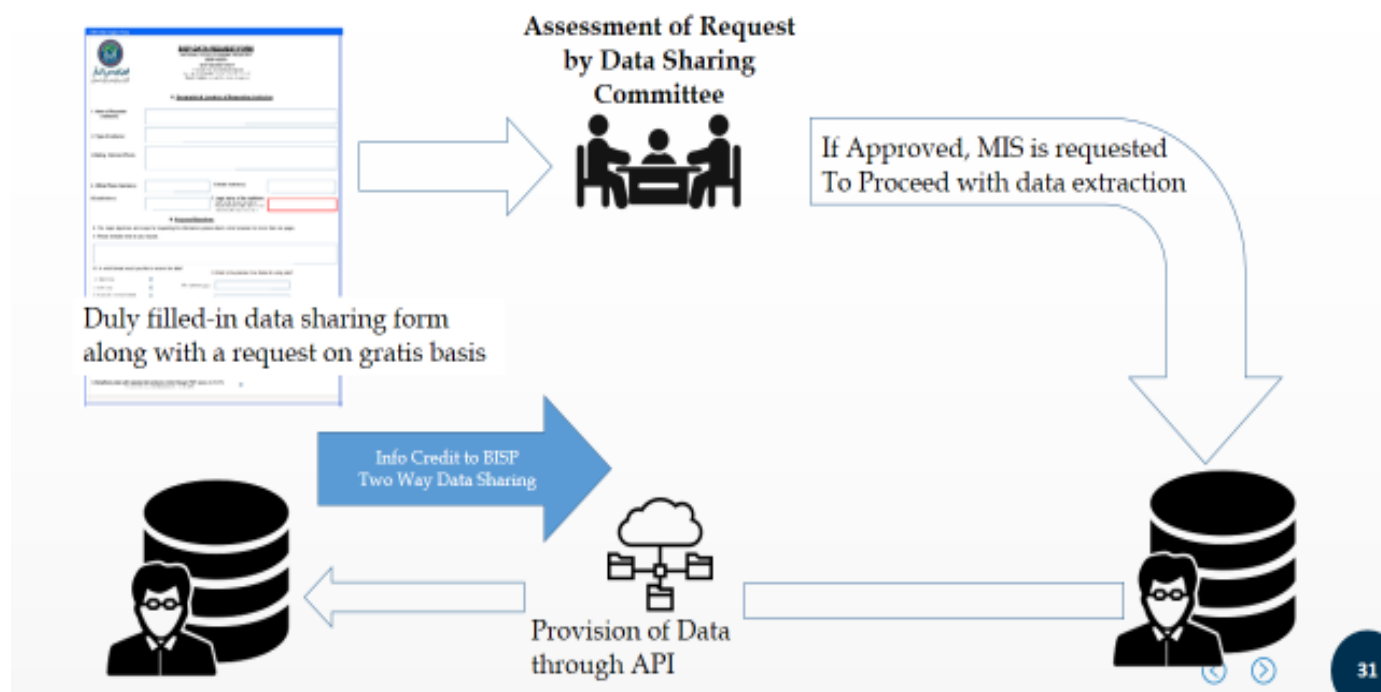


Fig 1: Flowchart of data sharing mechanism

Data Sharing Protocols (Section-B)



Nurturing Women Empowerment



ABSTRACT

This document describes the design and operational methodologies of data sharing and integration for National Socio-Economic Registry (NSER) with other public and private sector organizations, considering value and security of the database.



NATIONAL SOCIO-ECONOMIC REGISTRY

Data Sharing Protocols (Version 3.0)

1st Aug 2022

Document History

S. No	Category	Date(approval)	Version
1	Data Sharing Protocols	3 rd Nov 2015(24 th Board meeting)	V.1
2	Data Sharing Protocols	19 th Dec 2019(36 th Board meeting)	V.2
3	Data Sharing Protocols	1 st Aug 2022(56 th Board meeting)	V.3

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2 Executive Summary

As a result of Poverty Score Card (PSC) Survey 2010-11, National Socio-Economic Registry (NSER) was established containing information about household, education, employment, disability, living conditions and assets. This registry was used to decide eligibility of household and identification of recipients for Cash Transfer Programs. NSER can be used for many other purposes for the betterment of marginalized and vulnerable segment of society. It can pay its dividend if rightly utilized for planning purposes and rolling out other social initiatives in the country, to say the least.

True potential of NSER can be capitalized by converting it into a knowledge discovery platform and integrating it with other programs in public & private sector through a bi-directional data sharing. Such initiatives will enable other organizations to leverage on the existing source of information. It will also provide an opportunity to make NSER a living document. To achieve these objectives, BISP needs to institutionalize data sharing and bring a behavioral change within organization to facilitate knowledge exchange.

This document aims to assist BISP in setting their strategic goal of adopting data driven business model and to prepare an operational plan for data sharing based on legitimate and consistent decision making, ease of use, minimum human intervention and ensuring appropriate security of data.

3 National Socio-Economic Registry

All governments around the globe strive to alleviate poverty; Pakistan is no exception. The idea of social justice was always in the mind of its founding leader Quaid-e-Azam Muhammad Ali Jinnah, who expressed it with full commitment and resolve:

“There are millions and millions of our people who hardly get one meal a day. Is this civilization? Is it the aim of Pakistan? Do you visualize that millions are exploited and cannot get one meal a day? If that is the idea of Pakistan, I would not have it” (1943).

Since its independence, Government of Pakistan rolled out multiple programs for the welfare of marginalized segment of population. In 2010, Government institutionalized Social Safety Nets in form of establishing Benazir Income Support Programme (BISP) through an act of parliament with an objective of targeting poor people and providing them cash grants to increase their financial capacity and provide them with a cushion to absorb shocks of inflation and price hike.

BISP conducted a country wide Poverty Score Card survey in 2010 through which socio-economic status of citizens was collected and as a result National Socio-Economic Registry (NSER) was established. Currently, BSP is in process of updating NSER through a similar nation-wide exercise.

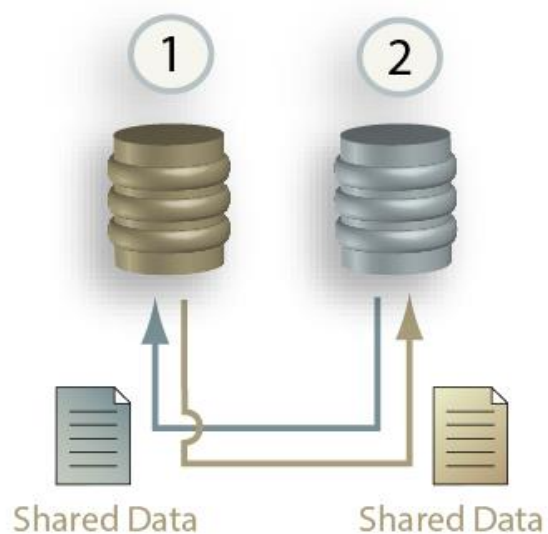
NSER was effectively used for targeting poorest of the poor by applying Proxy Means Tests (PMTs) and providing them with conditional and unconditional cash grants. However, NSER has much more potential to server within social welfare sector and with other public and private sector organizations which requires a detail operational plan for streamlining data sharing process.

4 Data Sharing & Integration

4.1 Data Sharing

Data sharing is a process where information is disseminated in one direction for the benefit of the other. Typically, public and private sector organizations have many back-end databases installed and being used for internal processes in silos. To improve efficacy of any such process, such organizations intend to seek information gathered by other organizational entities. For this purpose, a “point-to-point” data transaction is established where data gathered and information created by one organization is shared with another for enhanced benefits.

For example, BISP can seek assistance from Pakistan Telecommunication Authority (PTA) for checking validity of Cell Number provided by any individual during Computer Assisted Personal Interviewing (CAPI) or at Grievance Redressal Counter (GRC) in order to ensure smooth communication in future. Similarly, a commercial bank would like to know socio-economic value as defined within NSER before issuance of credit limit to its potential customer.

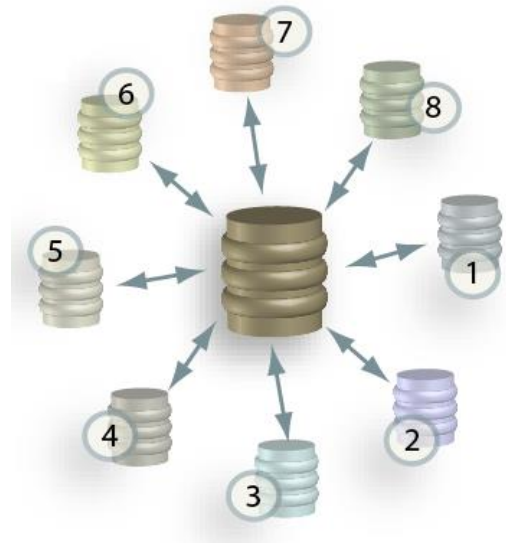


Such data sharing transactions are easier to implement. However, technological compatibility, corporate competition or departmental fear of losing control over its data remains a challenge.

4.2 Data Integration

Data integration is the combination of technical and business processes used to combine data from disparate sources into meaningful and valuable information. Unlike point-to-point data sharing with focus on having access to data in possession of other organizations, Data Integration between cross-organizational systems focuses on the data driven business workflows to keep an operational process moving forward.

As an example, any motor-vehicle registration against an individual who is part of a household that has been declared as beneficiary in NSER will put hold to further cash transfer automatically till verification on ground. Similarly, a beneficiary household can automatically obtain targeted subsidy from Utility Stores provided both organizations have integrated their databases.



When process integration is in place, the maximum level of efficiency is achieved and the power of data is put to its highest value. The technological data confluence that connects back-office databases/systems so that they can work together benefits in saving time and cost and facilitates informed decision making for real life problems. It creates a foundation for innovation and enables organizations for future growth.

5 Objectives of Data Sharing

Data sharing is typically a simpler process involving unidirectional flow of data from one system to the other, without much influence over business processes or workflows. Mostly such activities are performed for academic or research purposes. Another objective of data sharing activity can be achieving higher data quality, consistency and completeness of the target database.

National Socio-Economic Registry is a repository of data that carries tremendous value for other public and private sector organizations. Access to an individual's record or a household with its socio-economic profile is equally meaningful and sought-after piece of information. Statistical aggregate data and summary reports are beneficial for research and planning purposes.

Data sharing methodologies for NSER are described in subsequent paras in detail.

6 Data Classification

6.1 Available Data

Information available in National Socio-Economic Registry (NSER) can be categorized in following terms:

- Personal details of member of household including names, identity cards numbers, gender, Date of Birth, marital status, disability, education, employment status etc.
- Household composition including relations with Head of Household
- Address details of Household i.e. Province, District, Tehsil, UC, Village Name etc.
- Fixed Asset details for household with living conditions and access to basic amenities
- Agricultural assets
- BISP Beneficiary Status in PSC - 2010

Poverty Score Card – 2010 database contains similar information with addition of Proxy Means Testing (**PMT**) Score against registered households.

Although not directly a part of NSER, the Conditional Cash Transfer (CCT) database can be considered as an integrated program that uses information from NSER for its targeting purposes. It contains following information:

- Personal details of beneficiary and children
- Address and contact details of household
- Address and type of school along with available facilities
- Child's enrolment details in school
- Payment details

6.2 Classification Categories

Three categories are defined for classification of data related to NSER and PSC-2010. This includes:

- **Public**—A dataset that requires no authorization before sharing. Such dataset is usually available in public domain and is uploaded to organization's website linked with internet. Statistical aggregate data, summary reports and progress updates are candidates for this category.
- **Confidential** – A dataset that requires approval from authorized forum before granting access to outside organizations. Such data is not available to public and access can only be obtained through secure networking channels. Subject to approval and signing of Non-Disclosure Agreement, public and private organizations can have access to confidential data. Accessing a household information along with PMT Score and relevant socio-economic indicators including asset details on the basis of provided CNIC number of head or member of household falls under this category.
- **Secret** – A dataset that requires approval of highest decision-making forum i.e. Secretary BSIP or BISP Board before granting access. Such dataset is only available to Government organizations and that too on need basis. Latitude/Longitude as part of household address or CNICs of all members of House Hold are a good candidate for this category of data.

6.3 Data Classification

BISP has carried out a data classification exercise against all currently available data sets. Following is the summary outcome of data classification exercise:

S. No	Classification	Information
1	Public	Summary Reports, Survey Progress Reports, Statistical Aggregate Data (e.g. UC level count of disability, tehsil wise widows, Province wise count of beneficiary households etc.)
2	Confidential	Particulars of Head and members of household including names, contact details, age, gender, educational and employment status, disability etc. <hr/> Address of household and structure details <hr/> Assets details & living conditions <hr/> BISP Beneficiary Status & PMT Score <hr/> Payment details (CCT) <hr/> Selected CNIC(s) of household members/beneficiary(ies)
3	Secret	All CNICs of all household members <hr/> Latitude/Longitude of structure <hr/> Sensitive Survey questions

Data sharing interfaces are designed considering classification of data as mentioned above. NSER should periodically review classification of data and make necessary changes where required.

7 Legal Framework

A legal framework is the essence of smooth business operational strategy. It helps in business decisions for consistent organizational behavior and gives everyone a framework for how to act and operate in a potentially volatile landscape. A clearly defined legal framework holds executive accountable for their actions and in parallel gives them indemnity for their decisions within the ambit of rules and regulations.

The Benazir Income Support Programme (BISP) was established through an Act of Parliament, called Benazir Income Support Programme Act, 2010, that was promulgated to regulate affairs and matters of the Programme. Clause 4 (chapter II) of BISP Act, 2010 defines the objective and purposes of the Programme as follows:

- Enhance financial capacity of the poor people and their dependent family members;
- Formulate and implement comprehensive policies and targeted Programmes for the uplift of underprivileged and vulnerable people;
- Reduce poverty and promote equitable distribution of wealth especially for the low-income groups

Additionally, sub-section (c) of Section 10 of BISP Act, 2010 defines following powers and functions of the Management:

“10. Powers and functions of Management: - *The Management shall exercise powers and perform functions that are necessary to achieve the objects and purposes of this act, namely: -*

(c) to identify eligible persons or families for financial assistance or other benefits”

An evaluation from legal perspective is required to find out whether the BISP Act,2010 enables BISP to maintain and share National Socio-Economic Registry (NSER) or separate legislation is required for this purpose and can a regulation under Clause 6 of the said Act provide sufficient legal cover for Data Sharing & Integration by NSER with other public and private sector organizations.

A legal framework enacted through an act of parliament will enable systematic and consistent decision making for data sharing and integration of NSER and will provide a methodological approach that will regulate such data sharing activities amid concerns of data security and privacy of citizens.

An interim arrangement can be made under Para (d), sub-clause (1) of Clause 6 of BISP Act, 2010 that empowers BISP Board to make necessary regulations. A Regulation cannot replace Act; however, it provides an opportunity to overcome operational hindrances in day to day affairs. The relevant provision of BISP Act, 2010 is as follows;

6. (1) The Board’s powers and functions shall be –

(d) to make regulations and approve policies and manuals in order to carry out functions of this Act;

7.1 Data Governance Regulations

Under the provision of above-mentioned clause of the Act, BISP Board should make **“Data Governance Regulations”** for management of data/information within BISP as well as sharing with other public and private sector organizations. The Data sharing component of such regulation should have following contours:

- A broad baseline for types of data sharing services
- Methodologies of data integration
- Categorization of permissible clientage (e.g. Federal, Provincial and Local Government Departments, Private Sector Commercial Organizations, Non-Governmental Organizations, Educational and Research Institutes, Voluntary Citizens Groups etc.)
- Approval of baseline Data Classification
- Granularity and extent of Data being shared
- Authorized Data Communication Channels
- Data Sharing Authorization Forums with delegation of powers, where necessary
- Approval of Data Request Form(Schedule – I)
- Approval of Data Sharing Agreement(Schedule – II)
- Approval of Non-Disclosure Agreement (NDA)(Schedule – III)
- Approval of respective Data Metering Rates against each service (Schedule – IV)

7.2 Permissible clientage

List of potential data requesting agencies.

Permissible Organizations

S. No	Type of Organization	Conditions
1	Federal Govt Ministries, Departments, Autonomous Organizations, Authorities	----
2	Provincial Govt Ministries, Departments, Authorities	----
3	Local Govt Departments	----
4	International Donor Agencies	Having their office(s) in Pakistan
5	Local NGOs (Society, Waqaf, Trust, Foundation, Social Welfare Org, Nonprofit Company)	Should be registered with Govt of Pakistan
6	International NGOs	Should be registered with Ministry of Interior, Govt of Pakistan
7	Private businesses	Should be registered with SECP or any other Govt regulatory body
8	Pakistani Citizen or group of citizens	Valid CNIC (For statistical reports in public domain only)
9	Any other Organization	With the approval of Secretary BISP

7.3 Data Sharing Authorization Forums

Each data sharing request should have requisite authorization from appropriate management tier. It should either fall in a generalized category that has blanket approval or specific approval will be required for specific instance.

Following approval mechanism is suggested for handling data sharing requests:

S. No	Type of Request	Type of Report	Authorization
1	Statistical Aggregate Data	First design of report	DG NSER
		Already designed & published report	No authorization
2	Access to Confidential Data	Public Sector Organization	DG NSER
		Private Sector –New Category of Organization	Secretary BISP
		Private Sector - Organization from already approved category	DG NSER
		Complete Data Export *	BISP Board
3	Access to Secret Data	Each request	BISP Board

* Complete data export includes sharing of all data fields available within NSER

8 Data Sharing Methodologies

NSER can institutionalize Data sharing process by adopting standard methods and practices. Such standards will result in following benefits to the organization:

- Consistent decision making
- Consistent technical response
- Increase in operational efficiency
- Secure data management
- Audit trail
- Opportunity to adopt data-driven business model

8.1 Statistical Aggregate Data

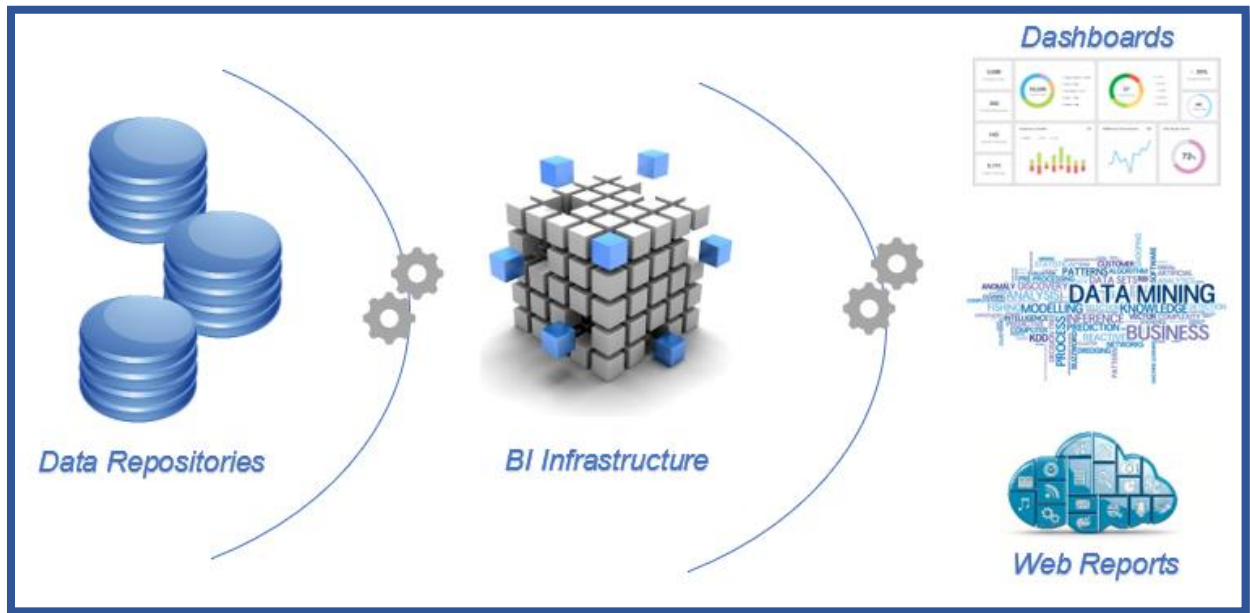
The aggregate data is the statistical representation of available information based on combining multiple measurements. It is a summarized view of data from a specific perspective and does not include individual record.

To unleash true potential of data available with NSER and to convert it into a knowledge discovery platform, BISP should deploy Business Intelligence (BI) software with data visualization and data analytics features. Such software is capable of interacting with under-laying databases to fetch fresh data in real-time and allow users to slice and dice data according to their area of interest. Using such software, BISP can launch an online dashboard where already known reports can be published. BISP can link such dashboard with its data sharing portal and give access to users in following categories:

S. No	Type of User	Domain
1	Technical Users having full access to data and BI software	BISP MIS Team
2	Business Users having ability to slice and dice data and generate customized reports	Public and Private sector organizations involved in planning and research
3	Consumers with access to static reports through dashboard	Public domain

Giving access of aggregate data to public sector organizations or business community for their planning and targeting purpose can be a revenue generating opportunity for BISP. On the other hand, such information can be very useful for social sector to align their efforts for maximum out-reach to the marginalized segment of population.

Following schematic design can be used by BISP for deployment of Business Intelligence infrastructure.



8.2 Data Sharing through Web Portal

An online web portal has pivotal role in data sharing practices. Such portals combine individual record or group of records from different data sources and present to the end-user in real time on the basis of pre-defined search criteria. Limiting access through authorization credentials (dedicated user name and passwords) and use of secure and encrypted channels, this type of data sharing is considered most appropriate in heterogeneous IT environments.

Following components are proposed for BISP web portal.

8.2.1 Role based User Access

A role-based user management module consists of user logins within their respective organizational hierarchy and pre-defined roles that links them with specific privileges on

successful login. Organizational hierarchy is necessary to implement uniform data metering standard for each user of its respective organization. Through pre-defined roles, level of access for each user can be managed.

Organizational Hierarchy

Level	Description	Explanation
Level - 1	Type of Organization	Federal Govt, Provincial Govt, Local NGOs, INGOs, Educational Institutes, Voluntary Groups etc.
Level - 2	Name of Organization	Ministry/Department/Organization Name
Level - 3	Geographic location of User	District/Tehsil/City
Level - 4	User Name	Name of the user. In most of the cases, it should be the designation of the user within his/her respective organization

Roles

S. No	Role	Privileges
1	Power	Can access secret and confidential data
2	Standard	Can access confidential data with no row limit
3	Basic	Can access confidential data with anonymized identity and with row limit

8.2.2 Search Criteria

Once successfully logged-in, the user will have following search criteria available to fetch record from under-laying databases.

Search Criteria

S. No	Search	Role	Return Response
1	CNIC based search	Power	Complete particulars of Head and members of household including CNIC, Contact No, address, assets information and PMT score
		Standard	Details of head and members of household with names, address, assets and PMT score without CNIC Nos of other members
		Basic	Name, address and PMT score of searched CNIC only
2	Address + Parameter search (combination of factors like disability, employment, living standard etc.)	Power	Complete list of households fulfilling searched criteria including CNIC, Contact No, address, assets information and PMT score
		Standard	List of households fulfilling searched criteria including names of head and members, gender, relation, age and address without CNIC and other secret information
		Basic	1% Sample data of respective address fulfilling searched criteria
3	PMT Range + Address search (e.g. Tehsil or UC Level address)	Power	Complete list of households falling under given PMT range along with CNIC, Contact No, address, assets information and PMT score
		Standard	List of households falling under given PMT range along with names of head and members, gender, relation, age and address without CNIC
		Basic	1% Sample data of respective address falling under given PMT range

8.2.3 Access Logging

Each serviced request must be logged in a transactional table along with following parameters:

- IP address of the client from where request was initiated
- User ID and User name
- Type of search
- Selected parameters
- Number of rows returned
- Timestamp

8.2.4 Network & Information Security

Necessary security measures in line with recommendations of Information Security Audit should be taken prior to implementation of web-based data sharing portal.

8.2.5 Web based Data Request Form

A web-based Data Request Form should be developed and published on NSER web portal containing following components:

- Particulars of Requesting Agency (Name of Organization, Address, Focal Person, Contact details)
- Purpose of the Organization
- Utilization of data being requested
- Type of data being requested with granularity
- Frequency of data sharing request (one time or continuous)

The Data Request Form should also contain downloadable Data Sharing Agreement and Non-Disclosure Agreement (NDA). It should also contain applicable Data Metering Rates and tentative time required to service the request. A separate section should include Frequently Asked Questions (FAQs) and contact details of focal person from BISP end.

8.3 Data Sharing through API

Application Programming Interfaces (APIs) provide common ground for seamless and automated data sharing between disparate systems within or outside organization. APIs are used by software to fetch or store data from one database to another based on operational conditions.

BISP can use bi-directional APIs with a combination of GET & POST requests to integrate NSER with data sources available with other organizations. As an example, BSIP can provide PMT score against a specific CNIC of household to Utility Stores. Utility Stores can calculate targeted subsidy to be provided to consumer in runtime on the basis of information received from NSER. In return, NSER will be updated with consumption pattern of that household from Point of Sale (POS) data of Utility Stores.

Layout of generalized data sharing APIs is similar as search requests (defined in para 8.2.2). For data fetching by BISP, custom APIs can be developed on the basis of agreed upon requirements of client organizations.

8.4 Data Metering

To ensure that systems are not unnecessarily burdened by the client organizations and to meet the operational cost of servicing data sharing requests, NSER will charge its clients for data sharing at following rate, to be approved by BISP Board.

Web Portal & API access

<i>S. No</i>	<i>Type</i>	<i>Rate (per row)</i>
1	Government Organizations/Departments	
2	Private organizations	

Statistical Aggregate Data

<i>S. No</i>	<i>Type</i>	<i>Rate</i>
1	Static Reports	
2	Business User - Government Sector	
3	Business User - Private Sector	

On the initiative and for the benefit of BISP, the data can be shared on gratis basis with other organizations for following reasons:

- To meet the operational requirements of BISP
- To enrich NSER with additional information held by other organizations.

8.5 Data Sharing Timelines

A service-oriented organization needs to have consistent timelines for delivery of its services. NSER should define service delivery timelines considering business requirement, type of service and organizational capacity. In this regard, following timelines are suggested:

- | | | |
|---------------------------------|---|----------------|
| • Statistical Report | - | 2 working days |
| • Access to online applications | - | 5 working days |
| • Sample data | - | 5 working days |

9 Objectives of Data Integration

As stated earlier, Data Integration is a process that involves systematically combining data from disparate data sources to obtain meaningful and valuable information which can be used for redesign business processes and workflows for informed and automated decision making.

9.1 Advantages of Data Integration

BISP has multiple business process challenges that can be addressed through effective data integration with other public and private sector organizations. The foremost challenge is to systematically validate the veracity of socio-economic indicators provided by citizen that form the basis for Proxy Means Testing and subsequently in declaration of eligibility for conditional or unconditional cash grant. Another challenge is to make National Socio-Economic Registry a living document with freshness and updates as much as practically possible. A vital event or change in economic condition of a citizen should be reflected in NSER and should automatically trigger a corrective measure in line with laid down business process.

An effective data integration of BISP NSER with other public and private sector organizations can result in following advantages:

- Continuous update of NSER
- Improved authenticity and reliability of socio-economic indicators
- Identifying and removing obvious outliers from NSER that are significantly different from other observations
- Cost reduction and saving time
- Informed decision making based on tangible evidence
- Better utilization of NSER for other e-governance initiatives

9.2 Potential Databases for Data Integration with NSER

BISP can integrate NSER with databases that exist within public sector of Pakistan. Such integration will result in mutual benefit, both for BISP as well as other organizational entities.

Some potential databases for integration with NSER are highlighted below. The list of such databases can be more exhaustive, but below mentioned databases are a good starting point, subject to their infrastructure readiness, organizational will and financial implications.

9.2.1 NADRA Citizens Registry

National Database & Registration Authority (NADRA) maintains citizens' registry of countrywide population. It issues a unique identity as Computerized National Identity Card (CNIC) number and maintains a demographic and biometric profile of each adult citizen. NADRA also maintains updated family tree based on parental hierarchy (Alpha family) and wed-lock relationship (Beta family).

A continuous update as a result of integration between NSER and NADRA databases can keep marital statuses and current addresses in NSER up to date. Such change in current addresses and marital statuses, especially instances of marriage and divorce for women, have major influence on composition of household in NSER. Similarly, change in employment status or obtaining National Identity Card for Overseas Pakistanis (NICOP)

or Arms License can be used as an indicator to help reduce inclusion errors for different programs.

An update from NADRA Citizens Registry with frequency of at least monthly basis can be beneficial for BISP for making informed decision making before release of payment.

9.2.2 Civil Registration Management System (CRMS)

Civil Registration Management System (CRMS) is a Programme being executed at Union Council level under local bodies governments. The main objective of this Programme is to digitally capture four vital events i.e. birth, marriage, divorce and death and issue certificates in this regard. Systems are integrated with NADRA where consolidation of vital events is carried out in form of a database.

Registered deaths in CRMS is an important piece of information and can be used to keep NSER updated with status of its registrants.

9.2.3 Computerized Electoral Rolls System (CERS) – ECP

Election Commission of Pakistan is maintaining Computerized Electoral Rolls System (CERS) in which each eligible voter (adult citizen having CNIC) is registered. This database has following advantages:

- CERS is the only database which is aligned to Household (Gharana No) issued during Housing Census
- The database is structured according to administrative layout of the country up to Census Block Code level that is the smallest administrative unit comprising of around 250 households
- Each voter entry is linked to a valid CNIC
- CERS is the most updated database in the country as it goes through annual revision process with inviting claims and objections and addressing them through a quasi-judicial process

A tightly coupled integration of NSER with CERS will keep the former updated with change in addresses, change in composition of household due to change in marital status

like marriages or divorces or due to rural to urban migration and updated list of deceased citizens. Similarly, CERS can take advantage of survey being carried out to update NSER.

9.2.4 Federal Board of Revenue (FBR) and Provincial Revenue Authorities

Federal Board of Revenue (FBR) and Provincial Revenue Authorities maintain lists of taxpayers for individuals (salaried class & business professionals) and corporate businesses having yearly income more than a defined threshold. A National Taxpayer Number (NTN) is issued to each taxpayer that is linked with his/her Computerized National Identity Card (CNIC) Number. FBR also maintains list of individuals claiming General Sales Tax (GST) refund.

Being registered with FBR or Provincial Revenue Authorities having income more than taxable bracket is a direct indicator of economic status of an individual that can be used to refine targeting and reduce inclusion errors.

9.2.5 Excise & Taxation Departments

Excise and Taxation Departments are working under Provincial Governments and are responsible for motor vehicle registration and collecting Motor Vehicle taxes, among other mandates. Vehicle registration databases are maintained by these departments for their respective provinces. The Motor Vehicle Owner's identity is linked with his/her Computerized National Identity Card (CNIC) Number which can be used as a common key for integration with BISP NSER.

Integration with Excise and Taxation department can help NSER to validate economic status of an individual obtained through survey.

9.2.6 Travel History

Federal Investigation Agency (FIA) maintains Integrated Border Management System (IBMS) that contains entry/exit travel instances from international border crossing points including airports, sea ports and land routes. The IBMS database is aligned with Machine Readable Passport (MRP) number which is linked with bearer's CNIC, thus providing a common key for integration with NSER.

The international travel or staying abroad for more than a specific time period, except visits to perform religious rituals, can be a useful indicator of economic status or activity of a NSER database entry. This information can be effectively used to identify and remove outliers from BISP Household Beneficiary list.

9.2.7 Employment Record

Employment status is a vital indicator of socio-economic status of a citizen. Minimum wage as announced by Governments in combination with number of dependents on bread-earner of household can be used to refine eligibility criteria of BISP beneficiary.

Federal and Provincial Accountant General Offices maintain database of employees of their respective governments. Similarly, Employees' Old-age Benefits Institute (EOBI) maintains list of individuals employed with private sector. These databases can be integrated with NSER to validate and keep updated status of employment of members of beneficiary household.

9.2.8 Criminal Record Office (CRO)

NSER can consider integration with Criminal Record Office (CRO) databases maintained by Provincial Home Departments/Police Authorities. These databases contain list of Proclaimed Offenders (POs) and convicted individuals. After due deliberation, a business rule can be adopted for necessary approvals where a convicted person or Proclaimed Offender cannot be declared eligible for financial benefits unless acquitted by the court.

9.2.9 Utility Stores Corporation (USC)

Utility Stores Corporation (USC) has a network of more than 5,000 utility outlets countrywide where food and non-food items are provided to poor segment of society on subsidized rates. USC is in process of adopting technology and is introducing online Point of Sale (POS) solutions at its stores.

Utility Stores Corporation can benefit from NSER in providing targeted subsidy on the basis of Proxy Means Test (PMT) score of a household. In return, NSER can obtain available expenditure patterns of households to refine its eligibility criteria for other programs.

9.2.10 Disaster Management Authorities

National Disaster Management Authority (NDMA) and Provincial Disaster Management Authorities (PDMAs) play a vital role in rescue, relief and recovery efforts in case of natural and man-made disasters. The poor segment of society is already vulnerable and becomes exposed to further hardships in case of any disaster.

An effective integration of Disaster Management Authorities with NSER can provide platform for quick relief and special treatment to beneficiary households.

9.2.11 Social Welfare Departments

Social Welfare Departments working under Federal and Provincial Governments are serving within their respective mandate for development and rehabilitation of marginalized and vulnerable segments of society, especially the physically and socially handicapped women and children.

Efforts of such Social Welfare Departments can become more effective and targeted by having access to NSER.

9.3 Prerequisites of Data Integration

Each external organization willing to integrate its database with NSER comply to following:

- Provide justification of using NSER
- Agree to provide feedback data to further enrich NSER
- Agree to pay operational costs at NSER end
- Make necessary arrangement for network and data security up to the satisfaction of NSER

9.4 Process for Data Integration

Following measures are suggested for enabling data integration of NSER with other public and private organizations:

- Approval of legal framework enabling data integration

- Business process reengineering with tweaking of workflows involved in validation of eligibility criteria or payment conditions on the basis of information obtained through data integration with other organizations
- Redesigning NSER database in a flexible manner to accommodate data received from various sources. Currently, NSER database is designed to service specific operational needs. Database remodeling to support data warehousing concepts through de normalization is suggested which will result in high performance required for analytical workload.
- Provisioning of secure network connectivity between NSER and other databases
- Development of generic Application Programming Interfaces (APIs) for bi-directional access of data in NSER and other databases
- Establishment of a dedicated desk for approaching public and private sector organizations for data integration with NSER and for managing interaction with client organizations

10 Personal Data security in NSER

Apart from secured transmission of data between BISP and the requesting organizations, the data sharing procedures will fully ensure the security and confidentiality of personal data of individuals via several measures.

10.1 BISP data Sharing Mechanism

BISP does not share complete data of a Household with any entity. A set of mechanism for sharing of selected data is devised which is followed in true letter and spirit for sharing of data to ensure personal information security and scrutiny of requester and justification of data required as under:

Step 1: Prior to submission of data sharing request, the requester should have overview of the data sharing protocols.

Step 2: Formal Request with a cover letter from organization with following documents to be provided:

- i. Filled in data-sharing form

- ii. A brief concept note of the project/program indicating the project design/scope and justification for utilization of the required data. In case the individual / beneficiary data is requested, then the requester has to share the complete details of utilization and how data will be safeguarded.
- iii. Additional documents in case of Private organization/NGO/INGO
 - a. Proof of registration with Government of Pakistan (SECP/ Ministry of Interior/EAD) with covering letter on organization's letter head.
 - b. Brief objectives/working of organization on Organization's letter head

Step 3: Upon receiving the request from the organization, preliminary meeting will be convened to assess the requesting organization's data requirements followed by review of required data, in-house processes and procedures for data security, identification/nomination of an individual to work as data custodian and sharing of IP/MAC address of a particular system which holds BISP's transmitted data and VPN access credentials/ policy of ensuring secure communication with BISP server.

Step 4: Approval of data-sharing request from "Data Sharing Committee" of BISP, after reviewing all aspects in-particular data management and security processes.

Step 5: If request is approved, a Non-Disclosure Agreement (NDA) between the requester and BISP will be signed. This document is to be signed by the Head of the organization/Project Director from requester and Director General (NSER) from BISP.

Step 6: MIS section will provide the data through APIs in consultation with the Technical team of the requesting organization.

10.2 Technical details entailing API development/consumption:

The objective of Cognitive Open API Architecture (CAA) is to allow data sharing between different organizations, hence developing a consolidated database which will have comprehensive information about social protection and poverty alleviation. The API is based on Open API Specifications which uses HTTP based GET, POST, PATCH AND UPDATE requests. Most of the parameters are provided in the JSON format. The partner organization will only have to add reference to Open API and consume the API using

standard HTTP Request and Response objects. API will take data in standard preapproved format (JSON) and will return standard codes as responses i.e., Successful Response (200), Unauthorized (401), Not Found (404) etc depending upon the response state.

The API can push as well as pull the data. The data pushing activity can be automated at partner organization end to push data at regular intervals. The automation of pushing data requires partner organization to build/develop automated services/applications/cronjobs etc. Partner organizations have to formulate/devise and prepare their data according to the format and standard provided by BISP as per in technical documentation. In case partner organizations requires guidance in their data preparation step, BISP may provide demo sessions to explain the process for data standardization. Non-standard data will not be acceptable by API and automatically be rejected with specific HTTP error code. Organization will be able to request data from BISP but in return they will also submit the data, they possess to BISP. For data sharing, BISP will provide every organization with a user name and a password. After authentication process, the client is authorized and presented with a unique JWT token along with its expiry time. The token should be attached with every API method header. A detailed cognitive API specification document has been created to help organizations in smooth integration and consumption. It is important to note that all the communication between BISP and partner organizations will be done through a secured VPN tunnel along with secure socket layer transport encryption.

Cognitive API has staging/training as well as live environment. Along with detailed specification document, organizations are required to use training environment first for testing the API. Test credentials to test out and integrate the API will be provided so that organizations can do familiarize themselves with API endpoints. The training environment provides a test bed for organizations to build their side of infrastructure for automation of data pushing etc. It is an SOP that the partner organization never push dummy/testing data on LIVE API. Access to LIVE URL along with live credentials will be provided once they have successfully consumed the staging environment. The provided API is version based. The initial version is V1.0 and if there is any changes, the

organization will have link of newer versions e.g V2.0 as well as V1.0. Deprecated endpoints may be removed when all organizations have shifted to the new version. Any update in API endpoints will be version based and any existing functionality of partner organizations services/applications workflow will not halt. They will be provided details of newer versions release notes and specifications as how to move from older version to newer ones. The organizations have to devise plan to move to newer endpoints once communicated by BISP. BISP can provided a specific deadline to partner organizations the expiry date/time of any API methods marked as deprecated. BISP may also update secure socket layer and security updates from time to time which will not halt existing application which partner organizations may have built for automation for data pushing, but they will be presented with Information from BISP about SSL (Secure Socket Layer) versions updates.

All the data that will be shared between the organizations through Cognitive APIs. The data is standardized through below 3 standard libraries:-

- I. Programme Enrollment Library Standard
- II. Asset Delivery Reporting Standard
- III. Geo Library Standard

For summary data, Oracle Business Intelligence (OBI) tool link will be provided to the organization which will allow the users to see high level reports. Bulk Data Downloader utility is a multi-threaded application which will download bulk beneficiaries' data through API taking quintile, province, divisions, districts and tehsils as input. Data for each tehsil will be saved in a separate file.

Keeping in view the data exchange between two parties through APIs must include Data in transit encryption i.e. SSL (Secure Sockets Layer)/TLS (Transport Layer Security) or using SSL/TLS Certificate that is verified by a CSA (Certificate Signing Authority) and should not be self-signed. Further bulk data sharing through APIs must support pagination or data limiting techniques (e.g. Tehsil based bulk data limiting).

The other bulk data sharing methodologies include privilege access control, SFTP (Secure File Transfer Protocol) with encrypted data at REST (Representational State Transfer) technique to ensure data integrity and data security.

10.3 Data security measures:

- i. Only authorized persons using approved processes will be able to access information through approval of Data Sharing Committee (DSC). DSC duly approved by Secretary (BISP) is in place to approve the data-sharing requests in the light of data-sharing protocols and recommend any related policy decision regarding sharing of data for consideration of the higher authorities.
- ii. Moreover, variables in the NSER are also classified in different categories as described in Section 6.3 based on the level of security in to public, confidential and secret data. This data classification is onward co-related with higher approval levels for thorough scrutiny. Some cases are described below for clarity:
 - For security of personalized information, BISP stores such variable in an encrypted manner. Whenever required, the data is transferred through a secured mechanism in an encrypted manner while the recipient decrypt it after successful data transfer. In-case of provision of data related to identity (CNIC) of entire household, which is classified as secret data, approval of BISP board would be required. However, if a Program/Project is targeting a specific household for provision of certain incentives, then only a subset of CNICs will be provided to address their bare minimum requirement after approval from Data Sharing Committee.
 - Likewise for research purpose and evaluations of the programs, it will be ensured that anonymized data is provided to the organizations/ educational institutes.
 - Also the variables like Proxy Mean Testing score(PMT) of particular Household being a sensitive information will only be shared on special request against the CNICs provided by the requesting organization for matching purposes. Otherwise only Socio-Economic Status (SES) of particular household will be shared.
 - GPS Coordinates are considered as part of the secret data classification, hence not shared with any organization. Based on reference points, BISP may perform Geographical mapping to report data.

**BISP-DATAREQUEST FORM**NATIONAL SOCIO ECONOMIC REGISTRY
(BISP-NSER)

BISP SECRETARIAT

"F" Block, Pak Secretariat, Islamabad

Tel: (+92-51) 924 5607-11, Fax: (+92-51) 921 5323

Email: info@bisp.gov.pk Web: www.bisp.gov.pk

A. Geographical Location of Requesting Institution1. Name of Requester
(Institution):

2. Type of Institution:

3. Mailing Address (Official):

4. Official Phone Number(s):

5. Mobile Number(s):

6. Email Address:

7. Legal status of the Institution:
Government Department/Office,
Registered/incorporated under an Act
INGO/NGO/Foreign affiliation, etc
B. Purpose/Objectives

8. The major objectives and scope for requesting the information (please attach a brief proposal not more than one page).

9. Please indicate what do you request:

10. In which format would you like to receive the data?

A. Hard Copy. B. Soft Copy. C. Access to live Mechanism.

11. What is the planned time frame for using data?

From(dd/mm/yyyy):

To:

C. Data Requirements

12. Location: Province

District:

Tehsil:

UC:

13. Select only one option from the following:-

i. Information Summary: ii. Custom Analysis on BISP Data (dimensions):
(Please select required dimensions from section 14)iii. Beneficiary data [lists]: iv. Beneficiary data with selected dimension(s) [lists] through PMT score (0-32):
(Please select required dimensions from section 14)

NSER Data Request Form

v. Beneficiary & Non-beneficiary data through PMT score(0-100):

vi. Any other data, please explain:

14. Dimensions: (dimensions at serial # viii -xiv cannot be selected altogether)

i). Poverty Score	<input type="checkbox"/>	ix). Educational Status.	<input type="checkbox"/>
ii). Area	<input type="checkbox"/>	x) Rooms (Count) .	<input type="checkbox"/>
iii) Gender.	<input type="checkbox"/>	xi) Toilet Type.	<input type="checkbox"/>
iv) Age Brackets .	<input type="checkbox"/>	xii) Electric Equipment.	<input type="checkbox"/>
v) Relationships.	<input type="checkbox"/>	xiii) Gas Equipment.	<input type="checkbox"/>
vi) Disability.	<input type="checkbox"/>	xiv) Kitchen Assets.	<input type="checkbox"/>
vii) Marital Status.	<input type="checkbox"/>	xv) Livestock.	<input type="checkbox"/>
vii) Employment Status.	<input type="checkbox"/>	xvi) Land.	<input type="checkbox"/>

15. Who inside and/or outside of your organization will have access to the data?(please specify)

16. Are you conducting own additional survey(s)?(if so, please specify the kind of data collected and the scope/coverage)

17. Indicate variables which you will return/push back to NSER via APIs? *

18. How frequently will variables/data be pushed back in NSER?

Monthly Quarterly

19. Have you ever received data from the NSER before? Yes No

20. Has the former data request been rejected by NSER? Yes No

21. Copy of CNIC of requester has been attached Yes No

I, the undersigned, hereby, certify that to the best of my knowledge, all information provided in this document is true and correct. I further understand and agree that any decision on the request for data is upon BISP NBR and that this request does not grant access per se.

Date (dd/mm/yyyy):

Signature of Authorized Requester
Name & Designation:

*Information not required for request of Summary data

IMPORTANT INDICATORS AND PROFILING IN NATIONAL SOCIO ECONOMIC REGISTRY



Geographic Data	a) Temporary and Permanent Address
	b) Contact No.
	c) GPS Coordinates
	d) Province
	e) District
	f) Tehsil
	g) Block and enumeration Area number
Demographics	Family Roster Information
	a) # of total members
	b) Gender Profiling
	c) # of children
	d) Age profiling
e) CNIC and B-Form Information	
Education	Literacy Status of the members
	a) Literate Population
	b) Out-of-school children
	c) Never gone to school
	d) Age 10+, 15+, gendered education profiling
e) Reasons of out of school children	
Health	a) Chronic Disease Profiling (Heart/ Cardiovascular, Cancer, Obstructed Pulmonary and Asthma, Diabetes, Hepatitis C, TB, Polio)
	b) Infant Mortality
	c) Stillbirth
Disability	Disability Profiling (Upper Limb Disability, Lower Limb Disability, Mental Disability, Speech Disability, Hearing Disability, Visual Disability (Partial), Visual Disability (Full))
Employment/ Labor force	a) Employment Status (Employed, Not employed but seeking work, Retired)
	b) Status/nature of employment (Daily-wage labor force (agri and non-agri), On job (public and private sector), Own business, Employer, etc.)
	c) Working hours and days
	d) Labour force participation
Energy Consumption	a) Availability of Electricity / Solar / UPS / Generator
	b) Availability of Gas
	c) Type of Fuel used in household (fuel wood, etc.)
	d) Appliance's profiling being run on electricity
Assets	Household Assets (Heater, Washing Machine, Geyser, AC, Fan, Cooking Range, Television, Refrigerator, Sewing/Knitting Machine, Laptop, Motorcycle, Tractor, Car, etc.)

IMPORTANT INDICATORS AND PROFILING IN NATIONAL SOCIO ECONOMIC REGISTRY



Structure Profiling	a) Dwelling and Non-Dwelling Structures
	b) Type of structure such as houses, offices, health facilities, shops, hostels, hotels etc.
	c) Construction types and material
Communications	1. Internet availability
	2. Laptop / Computers
	3. Mobile Phone
Agriculture Land Holdings	a) Agriculture Land availability
	b) Land units/area
	c) Cultivated land availability Cultivated land units/area
	d) Types of Cultivation
WASH	a) Formal and informal toilet availability (Flush connected to public sewerage or pit or open drain, Dry raised latrine, Dry pit latrine)
	b) Rate of open defecation
	c) Source of Drinking Water
Livestock	Small and Large Livestock profiling and numbers (Buffalo, cow, goat/ sheep, horse/ mule/ donkey and camel)