

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG, NEW DELHI 110002

<u>व्यापक परिचालन मसौदा</u>

हमारा संदर्भ : सीईडी 59/टी-9

07 मार्च 2024

तकनीकी समिति : पत्थर अनुभागीय समिति, सीईडी 59 प्राप्तकर्ता :

- 1. सिविल अभियांत्रिकी विभाग परिषद, सीईडीसी के सभी सदस्य
- 2. भवनों के लिए मिट्टी के स्मार्ट सिटी अनुभागीय समिति, सीईडी 59 के सभी सदस्य
- 3. रुचि रखने वाले अन्य निकाय।

महोदय/महोदया,

निम्नलिखित मानक का मसौदा संलग्न हैं:

प्रलेख संख्या	খার্ঘক
CED59(25010)WC	ड्राफ्ट भारतीय मानक आवासों का सतत विकास - आदर्श ग्राम के लिए संकेतक
	ICS 13.020.20

कृपया इस मसौदे का अवलोकन करें और अपनी सम्मतियाँ यह बताते हुए भेजे कि यह मसौदा प्रकाशित हो तो इन पर अमल करने में आपको व्यवसाय अथवा कारोबार में क्या कठिनाइयां आ सकती हैं।

सम्मतियाँ भेजने की अंतिम तिथि : 07 अप्रैल 2024

सम्मति यदि कोई हो तो कृपया अधोहस्ताक्षरी को ई-मेल द्वारा <u>divya.s@bis.gov.in</u> पर या उपरलिखित पते पर, संलग्न फोर्मेट में भेजें। सम्मतियाँ बीआईएस ई-गवर्नेंस पोर्टल, <u>www.manakonline.in</u> के माध्यम से ऑनलाइन भी भेजी जा सकती हैं।

यदि कोई सम्मति प्राप्त नहीं होती है अथवा सम्मति में केवल भाषा संबंधी त्रुटि हुई तो उपरोक्त प्रलेख को यथावत अंतिम रूप दे दिया जाएगा। यदि सम्मति तकनीकी प्रकृति की हुई तो विषय समिति के अध्यक्ष के परामर्श से अथवा उनकी इच्छा पर आगे की कार्यवाही के लिए विषय समिति को भेजे जाने के बाद प्रलेख को अंतिम रूप दे दिया जाएगा।

यह प्रलेख भारतीय मानक ब्यूरो की वैबसाइट <u>www.bis.gov.in</u> पर भी उपलब्ध हैं। धन्यवाद।

भवदीय

ह/-(द्वैपायन भद्र) वैज्ञानिक 'ई' एवं प्रमुख (सिविल अभियांत्रिकी विभाग)

सलंग्न: उपरिलिखित



WIDE CIRCULATION DRAFT

Our Reference: CED 59 /T-9

07 March 2024

Technical Committee: Smart City Sectional Committee, CED 59

ADDRESSED TO:

- 1. All Members of Civil Engineering Division Council, CEDC
- 2. All Members of Smart City Sectional Committee CED 59
- 3. All others interested

Dear Sir/Madam,

Please find enclosed the following draft:

Doc No.	Title
CED 59 (25010)WC	Draft Indian Standard on Sustainable Development of Habitats — Indicators for Adarsh Gram ICS 13.020.20

Kindly examine the attached draft and forward your views stating any difficulties which you are likely to experience in your business or profession, if this is finally adopted as National Standard.

Last Date for comments: 07 April 2024

Comments if any, may please be made in the enclosed format and emailed at <u>divya.s@bis.gov.in</u> or sent at the above address. Alternately, comments may be sent online through the BIS e-governance portal, <u>www.manakonline.in</u>.

In case no comments are received or comments received are of editorial nature, kindly permit us to presume your approval for the above document as finalized. However, in case comments, technical in nature are received, then it may be finalized either in consultation with the Chairman, Sectional Committee or referred to the Sectional Committee for further necessary action if so desired by the Chairman, Sectional Committee.

The document is also hosted on BIS website <u>www.bis.gov.in</u>. Thanking you,

Yours faithfully, Sd/-(DWAIPAYAN BHADRA) Scientist 'E' Head (CED)

Encl: As above

FORMAT FOR SENDING COMMENTS ON BIS DOCUMENT

[Please use A4 size sheet of paper only and type within fields indicated. Comments on each clause/sub-clause/ table/figure, etc, be stated on a fresh row. Information/comments should include reasons for comments, technical references and suggestions for modified wordings of the clause. **Comments through e-mail to** <u>divya.s@bis.gov.in</u> shall be appreciated.]

DOC. NO. & TITLE: CED 59 (25010) WC

NAME: Draft Indian Standard on Sustainable Development of Habitats — Indicators for Adarsh Gram. ICS 13.020.20

LAST DATE OF COMMENTS: 07 April 2024.

NAME OF THE COMMENTATOR/ ORGANIZATION:

Clause/ Para/Table/ Figure No. commented	omments/Modified Wordings	Justification of Proposed Change

NOTE - Kindly insert more rows as necessary for each clause/table, etc.

FOREWORD

(Formal clauses will be added later).

It is based on the BIS document Sustainable Development of Habitats —Indicators (IS 17000:2019 'Sustainable Development of Habitats — Indicators') and ISO 37120 : 2018 'Sustainable development of communities: Indicators for city services and quality of life'. However, this document has been prepared keeping in view the needs of sustainable development of the rural areas. It has duly adopted the village focussed policy frameworks such as the Rural Area Development Plan Formulation and Implementation (RADPFI) Guidelines, 2021, and the Pradhan Mantri Adi Adarsh Gram Yojna (PMAAGY).

This Indian Standard is designed to assist villages in steering and assessing the performance management of village services and all service provisions as well as quality of life. It considers sustainability as its general principle and resilience and inclusiveness as guiding concepts in the development of villages. All villages can make use of this document for assessment of their current status and development of framework for their sustainable growth.

These indicators are designed keeping variety of habitats in view and are equally applicable for any village, though the adaptation may require some attention, for region specific requirements, such as the coastal areas, the hills region, the desert/arid areas etc.

The term 'village' used at places should be deemed to include hamlets as well.

The Core Indicators described in this Indian Standard are considered essential for steering and assessing the performance management of services and quality of life in the villages.

In order to promote best practices, villages should also report on the Supporting Indicators given in this standard.

The core and supporting indicators are classified into themes according to the different sectors and services provided by a village. The classification structure is used solely to denote the services and area of application of each type of indicator when reported on by a village. This classification has no hierarchical significance and is organized alphabetically according to themes.

Indicators under each theme, where possible, were selected and paired on the basis of input and outcome indicators for further contextual analysis.

Summary table of the indicators is given at Annex A.

When interpreting the results of a particular service area, it is important to review the results of multiple types of indicators across themes; as focus on a single indicator can lead to a distorted or incomplete conclusion. Elements of aspiration of the village must also be taken into consideration in the analysis. For instance, if the village chooses to

remain a heritage village, a tourism village, a business hub, or an industrial hub, such aspiration should be retained and nurtured, while adopting this standard.

Indicators can be used for the village as a whole or for a part of a village, subject to availability of the required data. Indicators can also be aggregated to larger administrative areas (for example gram panchayat, mandal, block, etc). Indicators can be grouped together for analysis when taking into consideration holistic characteristics of a village. Finally, this set of indicators may be complemented by other indicator sets in order to have a more comprehensive and holistic approach to analysis on smartness and sustainability.

It is also important to acknowledge the potential antagonistic effects of the outcome of particular indicators, either positive or negative, when analysing the results. For example, an increase in air connectivity and the number of automobiles per capita could potentially result in increased levels of particulate matter and greenhouse gas emissions.

For data interpretation purposes, villages shall take into consideration contextual analysis when interpreting results. The local institutional environment may affect the capacity to apply indicators. In some cases, services may be delivered by private sector or the community itself.

The data sources indicated against various indicators in this document are, generally, those operated by national and state level bodies, such as the Registrar General-cum-Census Commissioner of India, Central Statistical Office, National Labour Bureau, National Crime Record Bureau, Central and State Pollution Control Boards, Ministries of Government of India including those of Health and Family Welfare, Housing and Urban Affairs and Human Resources Development and their State counterparts. This standard not only takes into consideration the ISO indicators but also the UN Sustainable Development Goals as also many other relevant national and international documents.

However, while for most of the national organizations, the detailed surveys for collection of data at times goes up to household levels, they normally project the analytical results at the national or state levels only, leaving a void for village level database. It should, however, be possible to secure the village level data from these bodies. For the future, it would also be desirable for the data collecting bodies to tabulate the survey data at local levels, such as the ward, village, hamlet etc. and publish the same on their portals in a format that would allow the users collate and generate results for higher levels, such as gram panchayat, block or district.

Villages should give attention to development of village-level database on real-time basis by digitizing their services. For instance, registration of the birth of a child should automatically lead to updating the statistics of village's population; issue of occupancy certificate (OC) for a building should lead to automatic updating the database on the number of buildings in the village and if the OC was given for a commercial building

then the village data or city data on number of commercial buildings should get updated automatically.

Villages would need to maintain their statistical information online, for which the Ministry of Statistics and Programme Implementation has developed a framework titled 'Basic Statistics for Local Level Development (BSLLD)'. The database should be dynamically linked with the village's business processes so as to update it on a real-time basis. Such database would facilitate immensely in adoption of these standards in developing Master Plans for integrated land-use and sector-specific plans, such as village mobility plan, village sanitation plan, village housing plan, etc, as also for development of projects for specific sectors.

While the data from the periodic surveys by national and state bodies, such as the decennial census of population and amenities or the five-yearly economic census, etc, would provide the benchmark statistics, the online BSLLD based profile information system suggested above would provide a framework for measuring the progress achieved by the village in different aspects and over time.

A list of profile indicators, which provide basic statistics and background information about the village is given in Annex B. Profile indicators are used as an informative reference about the village and can help villages determine which other villages could be of interest for peer comparisons.

This also aligns very well to the Sustainable Development Goals, namely SDG 2: "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture", Sustainable Development Goals, Goal 6: Ensure Availability and Sustainable Management of Water and Sanitation and SDG 12: "Ensure sustainable consumption and production patterns."

In the development of this standard, substantial assistance has been drawn from the following sources[:]

- 1. Rural Area Development Plan Formulation and Implementation (RADPFI) Guidelines, 2021, Ministry of Panchayati Raj, Government of India.
- 2. Urban and Regional Development Plan Formulation and Implementation (RADPFI) Guidelines, 2015, Ministry of Housing and Urban Affairs, Government of India.
- Agriculture Census, 2021-22 (and earlier years), Department of Agriculture and Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India.
- 4. Socio Economic and Caste Census (SECC) 2011, Ministry of Rural Development Government of India.
- 5. Census of India, 2011, Registrar General & Census Commissioner, India.
- 6. Pradhan Mantri Adi Adarsh Gram Yojna (PMAAGY) Ministry of Tribal Affairs, Government of India, Guidelines dated 17.3.2022.
- 7. Indian Public Health Standards 2022, Ministry of Health & Family Welfare, Government of India.

https://nhsrcindia.org/sites/default/files/PHC%20IPHS_2022_Guideline_pdf.pdf

8. Rural Health Statistics, published annually, Ministry of Health & Family Welfare, Government of India.

For the purpose of deciding whether a particular requirement of this standard is compiled with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 :2022 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that specified value in this standard.

Draft Indian Standard

Sustainable Development of Habitats — Indicators for Adarsh Gram ICS No. 13.020.20

Smart Cities Sectional Committee, CED 59

Last date of comments 07 April 2024

1 SCOPE

1.1 This standard defines and establishes methodologies for a set of indicators to steer the development and measure the performance of services and quality of life for sustainable habitats in villages for developing them as model villages or 'Adarsh Gram'.

1.2 This standard is applicable to a village that undertakes to measure its performance in a comparable and verifiable manner, irrespective of size and location. These indicators can be adopted for the villages in areas of different types of geo-climatic zones, with suitable zone-specific consideration.

NOTE — The word 'village' includes hamlets.

2 REFERENCES

The standard listed below contains provisions which through reference in this text, constitutes provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
IS/ISO 14064	Greenhouse gases
Part 1:2006	Specification with guidance at the
	organization level for quantification and
	reporting of green house gas emissions
	and removals
Part 2:2019	Specification with guidance at the project
	level for quantification monitoring and
	reporting of greenhouse gas emission
	reductions or removal enhancements
	(first revision)
Part 3:2006	Specification with guidance for the
	validation and verification of greenhouse
	gas assertions
SP 7:2016	National building code of India

3 TERMS AND DEFINITIONS

For the purpose of this standard, the terms and definitions given below shall apply.

3.1 Habitat — A human habitation defined by a specific administrative boundary, commonly referred to as a city, town, village, region, etc, or a duly notified part of a city or a village, such as a hamlet, or a ward.

NOTE — Depending upon requirements, specific definitions of a town, city, village, etc. can be seen in the relevant legislation of the state or the metadata of Census of India.

3.2 Indicator — A quantitative, qualitative or descriptive measure.

3.3 Panchayat – A local self-governance institution as notified under the relevant State Legislation.

3.4 Sustainable Development —The development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

3.4.1 Indicators in this standard are divided into following:

a) Core indicators — Indicators that are required to steer the development and measure the performance in the delivery of services and of quality of life.

b) Supporting indicators — Indicators that are recommended to steer the development and measure the performance in the delivery of services and of quality of life.

c) Profile indicators — Indicators that provide basic statistics and background information to help peer comparison of habitats. Profile indicators are used as an informative reference.

4 GENERAL

There is a continuous endeavour towards achieving better quality of life of the citizens keeping also in view the challenges from time to time. Services in a habitat provide effective means towards achieving the objective. These services in turn can be guided by a number of indicators directly or indirectly connected to sustainable development and better management of habitats.

4.1The indicators covered in this standard pertain to the following sectors, namely economy, education, energy, environment, finance, governance, health, housing, recreation, safety, sewerage and sanitation, solid waste, telecommunication and innovation, transportation, urban planning, and water supply.

5 ECONOMY

5.1 Gross Domestic Product (GDP) for the Village (Core Indicator)

5.1.1 General

Gross Domestic Product (GDP) is an indicator of overall production activity and level of economic growth of a village, city, district, state or a country.

5.1.2 Core Indicator Requirements

GDP shall be calculated as the sum of gross value added of all resident producer units plus that part of taxes, less subsidies, on products, which is not included in the valuation of output.

5.1.3 Data Source

Central Statistical Office (CSO), in the Ministry of Statistics and Programme Implementation (MoSPI), compiles the national and state level GDP, while the district level data is compiled by state Directorates of Economics and Statistics.

As of now, in general, Village and City level GDP is not directly reported. However, there are multiple options available to assess the GDP of a village. For instance, every Gram Panchayat is expected to maintain a register of trades and businesses by the households. Moreover, the Register of Buildings, maintained by the Panchayats for property tax purposes, usually indicates the type of economic activity that goes on in the respective buildings. With a bit of re-arrangement of the format and the processes, the various registers maintained by the Gram Panchayats and indicate the types of economic activities prevalent in the village. Such data, coupled with the information collected from various surveys and censuses, as explained below.

Agriculture Census: The Department of Agriculture and Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India conducts Agriculture Censuses in India in collaboration with States/UTs following standard concepts, definitions and methodology. Since the launch of first Agriculture Census in 1970-71, the country has conducted ten Agriculture Censuses so far and the last census with reference year 2021-22 will be 11th in the series. Entire Census operation is conducted in three phases and operational holding is taken as statistical unit at micro level for data collection. Based on the agriculture census data collected in three phases, the Department brings out three detailed reports analysing trends on various parameters at All India and States/UTs level. District/Tehsil level reports are prepared by the respective States/UTs.

Decennial Population Census: This is a decennial population census is conducted by the Registrar General cum Census Commissioner of India in all the States and Union Territories, and is based on 100 percent survey of all the households and captures the social and economic activities in a comprehensive framework.

Socio Economic and Caste Census: The Ministry of Rural Development, Government of India, had got the Socio Economic and Caste Census (SECC) 2011 conducted in June 2011 through a comprehensive door to door enumeration across the country. This is the first time such a comprehensive exercise has been carried out for both rural and urban India. It is also expected to generate information on a large number of social

and economic indicators relating to households across the country. Additionally, some states conduct socio-economic census at their own initiative, from time to time.

Economic Census: Another data source is the Economic Census (EC), conducted by the CSO through household level surveys every 5 years. Economic Census gives the basic entrepreneurial data for planning and development in each State specially for unorganized sectors of the economy. It is 100 percent centrally sponsored scheme of the Ministry of Statistics and Program Implementation, Government of India. Seven Economic Census have been conducted so far throughout the country during the year 1977,1980,1990, 1998, 2005, 2013, and 2019.

Coverage of Economic Census:

1. Economic Census is the complete count of all entrepreneurial units located within the geographical boundaries of the Country.

2. Information on number of establishments and employment in all type of establishments, unpaid/paid workers, female workers, child workers, ownership of establishments, use of power, registration of establishments, source of finance etc. is collected.

3.Complete address of enterprises having 10 or more workers is recorded.

As of now, the CSO does not publish the EC data at town, ward, city and village levels. However, unit level data, that is establishment level data with complete identification details of the establishments in terms of their location (like state, district, town, ward, tehsil, village along with enumeration block number) may be available for dissemination by of MoSPI to the data users on request. Based on the EC data, villages can work out their GDP.

NOTES

1 Except for the decennial population census, the results of all other census noted above are published only at District and/or State levels, besides the national level. However, with proper authorisation, village level data can be extracted.

2 Computation of GDP is a complex exercise in which data from various sources, such as from various types of organization of the establishments (like corporate sector, government, unincorporated establishments) on output, intermediate consumption, factor incomes, etc, are required for calculation of gross value added by an organization/industry. Information on number of workers in industry as per EC for the domain of interest (like district, city, etc) would be a valuable input for calculation of gross value added (GVA) particularly for unincorporated segment. Number of workers multiplied by GVA per worker for the domain, to be estimated based on a sample survey, would give an estimate of the aggregate GVA for the domain of interest.

5.1.4 Data Interpretation

GDP is a measure of level of economic development of the geographical unit (village, city, district, state, or country) in comparison to other geographical units. It represents the economic significance of a geographical unit in relation to the district, state and the country; and also provides a measure for comparing regional disparities.

5.2 GDP per Capita (Core Indicator)

5.2.1 General

GDP per capita, is the mean income of the people in an economic unit, such as a country, state, district, city, or village computed for each resident of the respective economic unit on an average basis.

5.2.2 Core Indicator Requirements

Per capita income of an economic unit such as a country, state, district, city, or village shall be calculated by taking a measure of all sources of income in the aggregate GDP and dividing it by the total population of the respective economic unit.

NOTE — Per capita GDP of a village represents the standard of living of the residents and provides a measure for comparing regional disparities. The village can also analyse the per capita income of intra- village regions, such as wards, or hamlets, to determine intra-village economic disparities and take measures for equalization, which could be more relevant for larger villages having many wards, hamlets etc.

5.2.3 Data Source

See 5.1.3.

5.3 Gini Coefficient (Supporting Indicator)

5.3.1 General

A measure of inequality, Gini coefficient measures the deviation of an income (or consumption) distribution from a perfectly equal distribution among individuals within an economy. It is also known as Gini index or Gini ratio.

5.3.2 Core Indicator Requirements

Gini coefficient is obtained from the Lorenz curve, which is a curve that plots the actual relationship between the percentage of income recipients and the percentage of income they actually receive. The cumulative percentage of population is plotted along the horizontal axis while the cumulative percentage of income is plotted along the vertical axis. The 45° line of equality indicates perfect income equality, that is each unit in the economy receives the same income. It may be calculated for the income levels or the consumption expenditure (monthly per capita consumption expenditure). Gini coefficient is obtained by dividing the area between the Lorenz curve and the 45° equality line by the entire area below the 45° line.

NOTE — A Gini coefficient of 0 indicates perfect income equality, while a Gini coefficient of 1 would imply perfect inequality where a single unit possesses all income of the economy.

5.3.3 Data Source

See **5.1.3**.

5.4 Unemployment Rate of the Village (Core Indicator)

5.4.1 General

The unemployment rate is considered one of the single, most informative labour market indicators reflecting the general performance of the labour market and the

health of the economy as a whole. It is used to measure unutilized labour supply and track business cycles of a village. When economic growth is strong, unemployment rates tend to be low and when the economy is stagnating or in recession, unemployment rates tend to be higher.

5.4.2 Core Indicator Requirements

A village's unemployment rate shall be calculated as the number of working-age residents who during the survey reference period were not in paid employment or self-employment, but available for work, and seeking work (numerator) divided by the total labour force (denominator). The result shall be multiplied by 100 and expressed as a percentage.

Unemployment shall refer to individuals without work, actively seeking work and currently available for work under the Usual Principal Status (UPS) approach. Persons who did not look for work but have a stake in future labour market (arrangements for a future job start) are counted as unemployed. Discouraged workers or hidden unemployed shall refer to persons who are not actively seeking work because they believe the prospects of finding it are extremely poor or they have restricted labour mobility, face discrimination, and/or structural, social, and cultural barriers, are not counted as unemployed or as part of the labour force. Not actively seeking work, shall refer to people who have not taken active steps to seek work (that is job searches, interviews, informational meetings, etc) during a specified recent period (usually the past four weeks).

NOTES

1 Labour force shall refer to the sum of the total persons employed and unemployed who are legally eligible to work and are seeking/available to work.

2 Reference period for employment/unemployment is past four weeks. However, in census, it is one year preceding the date of enumeration.

3 The estimates need to be based on the Usual Principal Status (UPS) approach. The major time criterion based on the last 365 days is used to determine the activity pursued by a person under the UPS approach. Accordingly, the major time spent by a person (183 days or more) is used to determine whether the person is in the labour force or out of the labour force. A person found unemployed under this approach reflects the chronic unemployment. The usual principal activity status estimates are derived based on a moving reference period of last twelve months. For example, if the household is surveyed in January 2023, then the reference period will be January 2022 to December 2022.

5.4.3 Data Source

The data of employment-unemployment survey for numeral indicator is available at national as well as state level with Labour Bureau. In some cases; the district level estimates are also available with respective states; where matching sample is collected for reaching out district level estimates of aforesaid indicator. Village level data can be obtained from census data, which gives the information on main workers, marginal workers and non-workers along with duration of working in a year, which can be a good approximation to the employment-unemployment status.

The Employment Registers maintained for the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) could also be utilised to secure data of unemployment.

5.4.4 Data Interpretation

The unemployment rate reflects the portion of the labour force which was available for work during the given reference period but did not get work.

The data on unemployment rate recorded for the same village at two different points of time would indicate the change in the situation of unemployment. It can also be considered as an indicator of the impact of the employment schemes, such as MGNREGS.

5.5 Female Entrepreneurship Rate (Self Help Group) (Core Indicator)

5.5.1 General

Self Help Group (SHG) is a group of micro or small entrepreneurs, normally females, who work synergistically to undertake some commercial activity such as manufacturing garments, cereals for the Mid-day Meals Scheme for school children, or and similar items, often selling through more organised intermediaries. At times, SHGs raise funds through bank loans as well. Recognising the effectiveness of SHGs, Governments often encourage them to participate in Government Schemes and programmes, providing financial support as well. The Government under the Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY – NRLM) also supports SHGs by way of interest subvention and other measures.

NOTE —There also are examples of SHGs functioning as an initiative of localised cooperation without direct financial assistance from government.

5.5.2 Core Indicator Requirements

Female Entrepreneurship Rate through Self Help Groups for a village shall be expressed as the ratio of the number of women in age-group of 15+, engaged actively with at least one Self Help Group (SHG) for a commercial or social activity (numerator) divided by the total number of women in age-group of 15+ in that village (denominator). The result shall be multiplied by 100 and expressed as a percentage.

5.5.3 Data Source

The data on the number of women in age-group of 15+, engaged actively with at least one Self Help Group (SHG) for a commercial or social activity is available with the District Industries Centre, whereas the total number of women in age-group of 15+ in that village should be available with the Census Department. However, if the figures for the total number of women in age-group of 15+ is not available, then the figures for the total number of women in all age-groups can be taken as proxy.

5.6 Assessed Value of Commercial and Industrial Properties as a Percentage of Total Assessed Value of all Properties (Supporting Indicator)

5.6.1 General

Assessed value of commercial and industrial properties as a percentage of total assessed value of all properties provides an understanding of the mix of assessed values of properties as well as the ability of the assessed base. A downward trend in the proportion of commercial and industrial assessed values could indicate an eroding economic base.

5.6.2 Supporting Indicator Requirements

The assessed value of commercial and industrial properties as a percentage of total assessed value of all properties shall be expressed as the assessed value of

commercial and industrial properties (numerator) divided by the total assessed value of all properties (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

Commercial and industrial properties shall refer to those, which have been designated by the village for commercial and industrial use.

NOTE — Property assessment methods may vary from one jurisdiction of the country to another, including the market-oriented method, the profit/rent-oriented method and the cost-oriented method.

5.6.3 Data Source

The data on above indicator is available from the property assessment records of the panchayat/local body of the village/area.

5.7 Number of Businesses per 1000 Population (Supporting Indicator)

5.7.1 General

The number of businesses per 1000 population indicates a city/village's level of economic activity and economic performance. It provides one indication of the overall business climate in a jurisdiction, and attitudes towards entrepreneurship. Strong entrepreneurial activity is closely associated with a dynamic and growing economy. The number of businesses is also used to inform competitiveness of a village and reflects both the number of new businesses created and the survival of existing businesses.

5.7.2 Supporting Indicator Requirements

The number of businesses per 1 000 population shall be calculated as the total number of businesses in a village (numerator) divided by one 1 000th of the village's total population (denominator). The result shall be expressed as the number of businesses per 1000 population.

Businesses shall refer to shops, eateries, enterprises, or companies. The enterprise is the smallest combination of legal unit, that is, an organizational unit producing goods or services. Business can either be categorized as simple (one operating entity) or complex (multiple operating entities).

5.7.3 Data Source

- a) Number of enterprises at village level can be obtained from the Economic Census conducted by Central Statistical Organization. Details can be seen in **4.1.3** above.
- b) State-level estimates are available through the NSS survey on Unincorporated Non-agricultural Establishments Excluding Construction.
- c) Number of industrial and commercial connections given by the electricity department can give village level data.
- d) Number of units registered/licensed with the Panchayat and/or District Industries Centre can give village level data.
- e) House-listing data of Census ('Use of Census Houses') can also give an idea about the number of business units, though in a limited manner.
- f) In many cases, the Panchayat also maintains information on businesses operating in the village, for the purposes of licensing and taxation.

g) Number of registered businesses under GST can also be the data source.

5.8 Percentage of cultivated lands brought under newer methods of agriculture (Core Indicator)

5.8.1 General

The newer methods of agricultural practices such as drip irrigation, application of soil and plant nutrients in liquid forms, etc. improve the yield, save on water, better management of soil health and enable securing higher income for the farmers. Land being a finite resource, it is highly desirable to encourage the villages go in for newer methods of agricultural practices such as drip irrigation, through growing number of farmers. In this part, drip irrigation is taken as the core indicator and indicators for other items/activities can be designed on similar pattern.

5.8.2 Core Indicator Requirements

The level of the adoption of drip irrigation as an agricultural practice shall be calculated as the area under cultivation through drip irrigation (numerator) divided by total area under cultivation in the village (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

5.8.3 Data Source

The statistics on crops and related aspects of agriculture is normally published at national, state and district levels and not at the village level. However, the Land Revenue Manuals/Codes of the States prescribe an annual review and recording of the crops being cultivated in each piece of land in every village, which is consolidated for each cropping season and for the year as a whole. Often, the usage of drip irrigation is not recorded in the village-level land records. However, the local unit of the State Agriculture Department has the data available in respect of both, the area under drip irrigation, and the total cropped area, in a village.

NOTE – Farmers are being supported in opting for drip irrigation with financial support under the Per Drop More Crop component of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY-PDMC) and the Micro Irrigation Fund (MIF) created with National Bank for Agriculture and Rural Development (NABARD, implemented through the State Agriculture Department.

5.9 Soil Health (Core Indicator)

5.9.1 General

Awareness about the quality and the type of the soil would enable the farmers know which types of crops would give the maximum yield. Often farmers might know by experience what crops grow and what crops fail; but they do not know what they can do to improve the condition of the soil. Therefore, information on the quality and the type of the soil would be helpful for assessment of the agricultural economy in the village.

5.9.2 Core Indicator Requirements

The status of farm holdings can be measured with respect to 12 parameters, as follows:

- a. Three Macro-nutrients: Nitrogen (N), Phosphorus (P), Potassium (K);
- b. Six Micro nutrients: Sulphur (S) (Secondary- nutrient); Zinc (Zn), Boron (B), Iron (Fe), Manganese (Mn), Copper (Cu); and

c. Three Physical parameters: pH, Electrical Conductivity (EC), Organic Carbon (OC.

5.9.3 Data Source

The Ministry of Agriculture and Farmers' Welfare has introduced the Soil Health Card (SHC) scheme, under which, the farmers are provided with SHC, wherein they can get the status of the soild health of their farmlands recorded, after getting the soil duly tested in the designated laboratories. SHC will enable the farmers to apply recommended doses of nutrients based on soil test values to realise improved and sustainable soil health and fertility, low costs and higher profits. Farmers can take a printout of the card from the SHC portal, which has a database of all harvesting seasons.

5.10 Crop Health (Core Indicator)

5.10.1 General

The term 'Crop health' denotes the biomass weight, grain weight, moisture, and other indicative factors of a particular crop per acre (or hectare) of land in a particular piece of land. If such pieces of land are selected in a suitable statistical sampling format, the data from a set of samples can be extrapolated to represent the crop yield for a larger area, such as a village, a Gram Panchayat, a Block, District, etc.

The traditionally popular method of assessment of the health, including the yield, of a crop in a region during a given cultivation cycle has been the Crop Cutting Experiments or CCE. Under the CCE, sample locations are selected based on a random stratified sampling of the total area under study. Once the plots are selected, the produce from a section of these plots is collected and analyzed for a number of parameters such as biomass weight, grain weight, moisture, and other indicative factors. The data gathered from this study is extrapolated to the entire region and provides a fairly accurate assessment of the average yield of the region under study.

In addition to conducting these CCEs to estimate total yield, the government and the insurance companies use this data for the Pradhan Mantri Fasal Bima Yojana (PMFBY), a scheme that assists insurance companies to disburse payment for farmers crop insurance claims seamlessly. The data gathered from CCE is useful to many other stakeholders in the value chain. While governments use it for planning agricultural policies and programmes for the future, the information helps financial institutions with many key inputs they need before offering loans or insurance coverage for the crops.

5.10.2 Core Indicator Requirements

The biomass weight, grain weight, moisture contents in a particular crop can be estimated as follows:

- a) Weigh at least three plants (of the same crop) in field selected for the trial and one plant in pot experiment from each of your treatments immediately after harvest to determine mean fresh weight of plants in each treatment.
- b) Dry the samples in an oven at 80°C for 48 hours and weigh the dry samples.
- c) Calculate moisture content of each sample as percentage of fresh weight as below:
- d) (fresh weight dry weight / fresh weight) × 100
- e) Subtract calculated weight of moisture from fresh weight of plants in all plots or pots of each treatment to estimate dry weight of plants.

5.10.3 Data Source

The State Agriculture Department, at its District and Block level offices, organise the crop-cutting experiment as per a notified schedule and maintain the record of the results obtained.

6 EDUCATION

6.1 Percentage of Female School-aged Population Enrolled in Schools (Core Indicator)

6.1.1 General

Education is one of the most important aspects of human development. This indicator addresses the issue of educational opportunity, by indicating how wide spread formal education is in the village among school-aged population. Reporting on the differential enrolment by gender is consistent with the Sustainable Development Goals (Goal 4 : Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all).

The Right to Free and Compulsory Education Act, 2009 provides a justiciable legal framework that entitles all children between the ages of 6 and 14 years to free and compulsory admission, attendance and completion of elementary education. It provides for children's right to an education that is based on principles of quality, equity and non-discrimination.

6.1.2 Core Indicator Requirements

The percentage of female school-aged population enrolled in schools shall be calculated as the number of female school-aged population enrolled at primary and secondary levels in public and private schools (numerator) divided by the total number of female school-aged population (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

NOTE — 'Enrolment' is the number of students who were enrolled in a grade as on 30 September of the school year. Information on the status is to be collected from school roster. Enrolment includes new entrants and repeaters for Grade I and new entrants, promotees and repeaters for Grade II onwards.

The proportion of enrolment in public and private schools should be reported, and village should ensure that private school data are included. In some villages, private schools are a significant component of education in the village.

For details of definition, the Sarva Shiksha Abhiyan Manual for Planning and Appraisal, issued by the Ministry of Human Resource Development (MHRD) may be referred.

6.1.3 Data on school enrolment is compiled by every state, district and local levels, under the Unified District Information System of Education- Plus (UDISE+) Programme of MHRD. Under UDISE+, the school and village level data is updated annually with 30 September as the reference date. The school/village/city level data comprises variables related to the access to educational facilities of various types, identification of habitation without access to primary and upper primary schools based on distance norms, inventory of all types of educational institutions including recognized and unrecognized schools in the villages, selected data on the number, enrolment and teachers/instructors in non-formal education and alternative schools, pre-primary education including Anganwadi and Balwadi. Data on age-specific

population and out of school children generated through household surveys forms part of the village/city data.

6.2 Percentage of Students Completing Primary Education: Survival Rate (Core Indicator)

6.2.1 General

Survival rate measures the holding power and internal efficiency of an education system. Survival rate to grade five of primary education is of particular interest since this is commonly considered as a pre-requisite for sustainable literacy. This indicator is often used as an assessment to Millennium Development Goals and continues to be relevant for the Sustainable Development Goals.

6.2.2 Core Indicator Requirements

The percentage of students completing primary education or survival rate shall be calculated as the total number of students belonging to a school-cohort who complete the final grade of primary education (numerator) divided by the total number of students belonging to a school-cohort, that is those originally enrolled in the first grade of primary education (denominator). The result shall then be multiplied by 100 and expressed as a percentage. The survival rate of primary education shall be expressed as the percentage of a cohort of students enrolled in the first grade of primary education who reached the final grade of primary education.

Survival rates for the private education sector should be reported, if known. The user of this standard shall note if private school data are included.

Promotees/Passouts : Out of the total enrolment in a grade (say, Grade III) as on 30 September during the base year (say 2022), it is those students who were promoted to the next higher grade (Grade IV) and are on roll as on 30th September of the following year (2023), are classified as promotees.

NOTE —This indicator measures students belonging to a school-cohort who has reached each successive grade of primary education without failing or moving to another jurisdiction.

6.2.3 Data Source

Since the calculation of this indicator is based on student flow rates, the reliability of the survival rate depends on the consistency of data on enrolment and repeaters (those who repeat one or more grades) in terms of coverage over time and across grades.

Data on school enrolment is available under the UDISE+ Programme of MHRD and can be accessed through the State Education Department and District Education Office.

NOTE— See 5.1.3 above for more details on UDISE+.

6.3 Percentage of Students Completing Secondary Education: Survival Rate (Core Indicator)

6.3.1 General

Survival rate measures the holding power and internal efficiency of an education system.

6.3.2 Core Indicator Requirements

The percentage of students completing secondary education or survival rate shall be calculated as the total number of students belonging to a school-cohort who complete the final grade of secondary education (numerator) divided by the total number of students belonging to a school-cohort, that is those originally enrolled in the first grade of secondary education (denominator). The result shall then be multiplied by 100 and expressed as a percentage. The survival rate of secondary education shall be expressed as the percentage of a cohort of students enrolled in the first grade of secondary education who reached the final grade of secondary education.

Survival rates for the private education sector should be reported, if known. The user of this standard shall note if private school data are included.

NOTES

- 1 This indicator measures students belonging to a school-cohort who has reached each successive grade of secondary education without failing or moving to another jurisdiction.
- 2 This methodology is adapted from UNESCO Education Indicator Technical Guidelines and is generally in line with the All India School Education Survey conducted in all the States/Districts by the Ministry of HRD/National Council for Educational Research and Training (NCERT).

Example: If the village reporting year is 2019 and secondary education lasts seven years, report the percentage of students that entered secondary education in 2011 and reached the final grade of secondary education in 2018.

³ Since the calculation of this indicator is based on student flow rates, the reliability of the survival rate depends on the consistency of data on enrolment and repeaters (those who repeat one or more grades) in terms of coverage over time and across grades.

6.4 Primary Education Student-Teacher Ratio (Core Indicator)

6.4.1 General

The student-teacher ratio is an indicator of the adequacy of teacher availability and can be related to the strength and quality of an education system.

6.4.2 Core Indicator Requirements

The student-teacher ratio shall be expressed as the number of enrolled primary school students (numerator) divided by the number of full-time equivalent primary school classroom teachers (denominator). The result shall be expressed as the number of students per teacher.

The number of classroom teachers and other instructional staff (for example teachers' aides, guidance counsellors), shall not include administrators or other non-teaching staff. It shall also not include 'Kindergarten' or pre-school teachers and staff.

NOTES

- 1 Specific definition of various terms in respect of elementary education is available in the UDISE+ Report, published by MHRD annually.
- 2 As per Right of Children to Free and Compulsory Education (RTE) Act, 2009, the Pupil-Teacher Ratio (PTR) norms for primary and upper primary level are 30:1 and 35:1 respectively.

6.4.3 Data Source

The number of full-time equivalent primary school classroom teachers and the number of enrolled primary school students is available under the UDISE+ Programme of MHRD and can be accessed through the State Education Department and District Education Office.

6.4.4 Data Interpretation

The student-teacher ratio reflects teacher workload and the availability of teachers' services to their students. The lower the student-teacher ratio, the higher the availability of teacher services to students. The student-teacher ratio has implications not only for the cost of education, but also for the quality. Higher educational attainment is correlated with a lower student-teacher ratio.

6.5 Percentage of School-aged Population Enrolled in Schools (Supporting Indicator)

6.5.1 General

Education is one of the most important aspects of human development. This indicator addresses the issue of educational opportunity by indicating how widespread formal education is in the village among the school-age population.

6.5.2 Supporting Indicator Requirements

The percentage of school-age population enrolled in schools shall be calculated as the number of school-age population enrolled in primary and secondary levels in public and private schools (numerator) divided by the total number of the school-age population (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

6.5.2.1 Enrolment in public and private schools (recognized by the Central or State Government) should be reported, and it shall be noted in the comment section if private school data are included. In some villages, private schools are a significant component of education in the village. Enrolment in religious schools and home schools should be included, if they are recognized.

Part-time enrolment of a half-day or more shall be counted as a full-time enrolment.

6.5.3 Data Source

Data on school enrolment is compiled by every state, district and village/city, under the Unified District Information System of Education- Plus (UDISE+) Programme of the Ministry of Human Resources Development (MHRD). Under UDISE+, the school and village level data is updated annually with 30 September as the reference date. The school/village/city level data comprises variables related to the access to educational facilities of various types, identification of habitation without access to primary and upper primary schools based on distance norms, inventory of all types of educational institutions including recognized and unrecognized schools in the village, selected data on the number, enrolment and teachers/instructors in non-formal education and alternative schools, pre-primary education including Anganwadis and Balwadis. Data on age specific population and out of school children generated through household surveys forms part of the village/city data.

6.6 Availability of mid-day meals programme for School-aged Population (0-14) Enrolled in Schools (Supporting Indicator)

6.6.1 General

A mid-day meal is a school lunch provided to children in the schools. It is generally accepted that the provision of mid-day meals helps in increasing enrolment in schools, increasing attendance, mitigating classroom hunger, reducing the drop-out rate among students, improving socialisation among children, besides addressing the issue of malnutrition among children. In addition, the mid-day meals programme also facilitate empowering the women through employment.

Mid-day meals programmes are one a major mission programmes of the Governments at all levels and are usually applicable for students of classes I to VIII.

6.6.2 Supporting Indicator Requirements

The availability mid-day meals programme of school-age population enrolled in schools shall be calculated as the number of school-age population (Age up to 14 years) enrolled in public and private schools that are being provided with mid-day meals free of cost (numerator) divided by the total number of the school-age population (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

6.6.3 Data Source

Data on the availability mid-day meals programme for school-age population enrolled in schools is collected as a part of the "Unified District Information System For Education Plus" (UDISE+). UDISE+ has a mandate of collecting information from all recognized and unrecognized schools imparting formal education from Pre-primary to XII.

6.7 Access to Secondary and Higher Secondary School as per distance criterion (Core Indicator)

6.7.1 General

In order to meet the challenge of Universalisation of Secondary Education (USE), there is a need for ensuring proximate location of the Secondary and Higher Secondary Schools for the children in the relevant age-group. In the rural areas, public transport is not easily available, in most cases, which justifies the need for a distance limit.

6.7.2 Core Indicator Requirements

The New Education Policy 2020 (Para 1.4.2) describes the distance criterion as Secondary Schools within 5 kms, and Higher Secondary Schools within 7-10 kms, which can be considered as the benchmark. This should be adopted as the criteria for measurement of the achievement of this objective.

6.7.3 Data Source

Data on distance of the available school from the pupils' households, can be measured easily with the help of the local panchayat and school education officials.

6.8 Access to College (Core Indicator)

6.8.1 General

In respect of Higher Education, the New Education Policy, 2020 has made significant recommendations on various aspects of education that include moving towards multidisciplinary and holistic education, integration of technology, multidisciplinary curricula, and availability of content in Indian languages.

6.8.2 Core Indicator Requirements

The New Education Policy 2020 has recommended (Para 10.8) that "there shall, by 2030, be at least one large multidisciplinary Higher Education Institution (HEI) in or near every district." The NEP also recommends promotion of Open Distance Learning (ODL) for HE (Para 10.10). Hence, access to college through ODL may also be considered as for this indicator.

6.8.3 Data Source

Data on distance of the available colleges from the pupils' households, can be measured easily with the help of the local panchayat and school education officials.

6.9 Literacy Rate for adult females Aged 15+(Core Indicator)

6.9.1 General

Literacy has been widely acknowledged as one of the major instruments for social and economic empowerment of all adults. The National Education Policy (NEP) 2020 launched on 29.07.2020 has recommended that "Strong and innovative government initiatives for adult education will be affected as soon as possible to expedite the all-important aim of achieving 100% literacy". In line with this recommendation, the Government has launched a new scheme "**New India Literacy Programme** for the period FYs 2022-2027 to cover all the aspects of Adult Education. Government has also decided in February 2022 that the term "**Education For All**" will be used in place of "**Adult Education**" in view of the fact that the terminology "Adult Education" was not incorporating appropriately all non-literates of 15 years and above age group.

6.9.2 Core Indicator Requirements

Literacy is the ability to read and write a short simple statement on his/her everyday life.

The percentage of female population that is literate shall be calculated as the number of females in age group 15+ that can read and write in their vernacular language (numerator) divided by the total number of female population in that aged group (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

6.9.3 Data Source

Data on literacy rates are available for the village levels in the decennial census figures. During the intervening periods, sample surveys are conducted by the National Sample Survey Organisation and Education Department, but the results are available at higher levels and not village levels. Therefore, it is recommended to use the decennial census data for a village as the baseline data and conduct period surveys to get the current status. The village panchayat can be assigned the responsibility to maintain and update the data.

7 ENERGY

7.1 Percentage of Total Energy Derived from Renewable Sources, as a Share of the Village's Total Energy Consumption (Core Indicator)

7.1.1 General

Promotion of renewable energy sources, such as biogas, biomethanation, solar energy, wind energy etc., is a high priority for sustainable development, for reasons, such as the security and diversification of energy supply and for environmental protection.

7.1.2 Core Indicator Requirements

The share of a village's total energy consumption derived from renewable sources shall be calculated as the total consumption of electricity generated from renewable sources (numerator) divided by total energy consumption (denominator). The result shall then be multiplied by 100 and expressed as a percentage. Consumption of renewable sources, including the energy from fuel cell, should include geothermal, solar, wind, hydro, tide and wave energy, and combustibles, such as biomass.

7.1.3 Data Source

Data should be available from local utility provider, or environment office.

NOTE — Some of the renewable sources of energy could be set up on standalone basis, such as biogas, and in such cases, data will need to be collected through a survey.

7.1.4 Data Interpretation

Renewable energy shall include both combustible and non-combustible renewables. Non-combustible renewables include geothermal, solar, wind, hydro, tide and wave energy. For geothermal energy, the energy quantity is the enthalpy of the geothermal heat entering the process. For solar, wind, hydro, tide and wave energy, the quantities entering electricity generation are equal to the electrical energy generated. The combustible renewables and waste (CRW) consist of biomass (fuel wood, vegetal waste, ethanol) and animal products (animal materials/waste and sulphite lyes), municipal waste (waste produced by the residential, commercial and public service sectors that are collected by local authorities for disposal in a central location for the production of heat and/or power) and industrial waste.

NOTE — The data on breakdown of energy consumption by source (that is, energy derived from fossil fuel; derived from nuclear; derived from renewable, etc, in percent), if available, should be noted.

7.2 Total Electrical Energy Use per Capita (kWh/Year) (Core Indicator)

7.2.1 General

An understanding of how much electricity is currently being consumed is needed in order to effectively manage generation, consumption, and conservation of electricity. Electricity is used to produce goods and services that are needed for economic growth and improved quality of life. Total electrical consumption reflects the overall consumption used by commercial, industrial, and residential sectors.

7.2.2 Core Indicator Requirements

Total electrical energy use per capita shall be calculated as the total electrical usage of a village in kilowatt-hours including residential and non-residential use (numerator)

divided by the total population of the village (denominator). The result shall be expressed as the total electrical energy use per capita in kilowatt hour/ year.

7.2.3 Data Source

Data shall be gathered from electricity providers. Electricity consumption statistics are typically collected in three categories: residential, commercial and industrial.

NOTE — Electricity providers typically report electricity consumption statistics by customer and not by resident or they report consumption by sector (residential, commercial and industrial) in bulk and then report more detailed statistics as averages.

7.2.4 Data Interpretation

Compilation of the sources used to generate energy based on fossil and renewable energy sources, types of renewable energy already in use, identification of locally existing renewable energy sources, compilation of the energy required for heating and cooling processes, and completed and planned measures to save energy and to improve energy efficiency, and completed and planned activities for the environment friendly insulation and cooling of buildings, if available should be noted.

7.3 Total Residential Electrical Energy Use Per Capita (kWh/Year) (Supporting Indicator)

7.3.1 General

An understanding of how much electricity is currently being consumed is needed in order to effectively manage generation, consumption, and conservation of electricity. Residential areas are one of the major consumers of electricity and its associated resource use.

7.3.2 Supporting Indicator Requirements

Total residential electrical energy use per capita shall be calculated as the total residential electrical usage of a village in kilowatt hour (numerator) divided by the total population of the village (denominator). The result shall be expressed as the total residential electrical energy use per capita in kilowatt hour/year.

7.3.3 Data Source

Data should be gathered from electricity providers. Electricity consumption statistics are typically collected in three categories, residential, commercial and industrial.

NOTE — Electricity providers typically report electricity consumption statistics by customer and not by resident or they report consumption by sector (residential, commercial and industrial) in bulk and then report more detailed statistics as averages.

7.4 Total Electrical Energy Use Per Hectare of Cultivated lands for farming activity per Year (Core Indicator)

7.4.1 General

An understanding of how much electricity is currently being consumed in the agriculture sector is needed in order to assess the extent of modernisation of the agricultural practices, leading to higher returns for the farmers.

7.4.2 Core Indicator Requirements

The total electrical energy use per hectare of cultivated lands for farming activity per year shall be calculated as the total electrical energy supplied by the service (electricity) provider for the agriculture sector in kilowatt hour for the year (numerator) divided by the total area under cultivation in the village in hectares (denominator). The result shall be expressed as the total electrical energy use per hectare of cultivated lands for farming activity per year.

7.4.3 Data Source

Data for the total electrical energy supplied for the agriculture sector shall be gathered from the electricity provider.

Data for the total area under cultivation for the year in the village shall be secured from the Land Revenue and Agriculture Departments.

NOTE — Some farmers use standalone electricity generators, such as diesel generators and data for such cases would have to be secured from the farmers concerned.

7.5 Average Number of Electrical Interruptions per Customer per Year (Supporting Indicator).

7.5.1 General

Average number of electrical interruptions helps to track and benchmark reliability performance in electric utility services.

7.5.2 Supporting Indicator Requirements

The average number of electrical interruptions per customer per year shall be calculated as the total number of customer interruptions (numerator) divided by the total number of customers served (denominator). The result shall be expressed as the average number of electrical interruptions per customer per year.

Electrical interruptions shall include both residential and non-residential.

It is normal to expect interruptions in service for a number of reasons including scheduled maintenance and equipment breakdown. To establish the opportunity to have a reasonable comparison between energy providers, major storms and weather events should be excluded due to their unpredictability and randomness since they are difficult to predict, prevent or mitigate against.

7.5.3 Data Source

Data shall be gathered from electricity providers.

NOTE — This indicator is affected by the age, standard of maintenance and reliability of the infrastructure that constitutes the electricity grid and the electricity transmission capacity that services the grid. The ability of both the grid and its electricity transmission capacity to provide supply on demand and to cope with peak load is also an important consideration.

7.6 Average Length of Electrical Interruptions (in Hours) (Supporting Indicator)

7.6.1 General

Average length of electrical interruptions helps to track and benchmark reliability performance in electric utility services.

7.6.2 Supporting Indicator Requirements

The average length of electrical interruptions shall be calculated as the sum of the duration of all customer interruptions, in hours (numerator) divided by the total number of customer interruptions (denominator). The result shall be expressed as the average length of electrical interruptions in hours.

Electrical Interruptions shall include both residential and non-residential.

It is normal to expect interruptions in service for a number of reasons including scheduled maintenance and equipment break down. To establish the opportunity to have a reasonable comparison between energy providers, major storms and weather events shall be excluded due to their unpredictability as they are difficult to prevent or mitigate against.

7.6.3 Data Source

Data shall be gathered from electricity providers.

NOTE — This indicator is affected by the age, standard of maintenance and reliability of the infrastructure that constitutes the electricity grid and the electricity transmission capacity that services the grid. The ability of both the grid and its electricity transmission capacity to provide supply on demand and to cope with peak loads is also an important consideration.

7.7 Percentage of Transmission and Distribution (T&D) Losses (Supporting Indicator)

7.7.1 General

Energy losses occur in the process of supplying electricity to consumers due to technical and commercial reasons. The technical losses are due to energy dissipated in the conductors, transformers and other equipment used for transmission, transformation, sub-transmission and distribution of power. These technical losses are inherent in a system and can be reduced to a certain level.

Pilferage by hooking, bypassing meters, defective meters, errors in meter reading and in estimating unmetered supply of energy are the main sources of the commercial losses. When commercial losses are added to the technical losses, it gives Transmission and Distribution (T and D) loss.

There is another component of commercial losses, which is attributable to nonrecovery of the billed amount, which is reflected in collection efficiency. T and D losses together with loss in collection give us the Aggregate Technical and Commercial (AT and C) losses.

7.7.2 Supporting Indicator Requirements

The methodologies for computation of T and D losses and AT and C losses are as follows:

a) Transmission and distribution losses (T and D losses):

T and D losses =
$$1 - \frac{Total energy billed}{Total energy input in the system} \times 100$$

Aggregate technical and commercial losses (AT and C losses):

AT and C losses = $1 - Billing \ efficiency \times collection \ efficiency$

where

 $Billing \ efficiency = \frac{Total \ unit \ billed}{Total \ unit \ input}$ $Collection \ efficiency = \frac{Revenue \ collected}{Revenue \ billed}$

Ideally, reduction of technical losses should be the parameter for evaluation of performance of distribution companies (DISCOMs). However, the technical losses of the DISCOMs are not available and also it involves a cumbersome process to calculate the technical losses, which varies based on various factors like loading pattern, etc. Now, only the T and D losses and AT and C losses are available as the performance parameter for achieving energy efficiency by DISCOMs. Out of the two parameters, T and D loss parameter seems to be appropriate parameter, which reflects energy savings to a greater extent as compared to AT and C losses.

7.7.3 Data Source

Information on the T and D losses for the village is available with the respective DISCOMs, who also maintain the data for disaggregated levels within a village, such as wards, hamlets, etc. The periodicity of publication of the information is usually monthly.

8 ENVIRONMENT

8.1 Fine Particulate Matter (PM_{2.5}) Concentration (Core Indicator)

8.1.1 General

Fine particulate matter can cause major health problems in villages. The concentration of particulate matter (PM) is harmful to human health. PM is carcinogenic and harms the circulatory system as well as the respiratory system. Although all PMs are not carcinogenic, some sources are classified as human carcinogen and harmful to human being. One of the evidence of PM and its public health impact is consistent in showing adverse health effects at exposures that are currently experienced by urban populations in both developed and developing countries. The range of health effects is broad, but is predominantly to the respiratory and cardiovascular systems.

8.1.2 Core Indicator Requirements

Fine particulate matter ($PM_{2.5}$) concentration shall be calculated as the total mass of collected particles that are 2.5 microns or less in diameter (numerator) divided by the volume of air sampled (denominator). The result shall be expressed as the concentration of $PM_{2.5}$ in micrograms per cubic meter (μ g/m³).

The method for measurement shall involve the use of an air sampler, which draws ambient air at a constant flow rate into a specially shaped inlet where the suspended particulate matter is initially separated into one or more size fractions within the PM_{2.5} size range. The 24 hourly (daily) measurements of PM_{2.5} concentrations are computed and data is 24 hourly and annually compiled for each monitoring stations.

8.1.3 Data Source

The Central Pollution Control Board (CPCB) is executing a nation-wide programme of ambient air quality monitoring known as National Air Quality Monitoring Programme (NAMP). The network consists of 621 operating stations covering 262 cities/towns in 29 States and 5 Union Territories as on date and the coverage is expanding.

The objectives of the NAMP are to determine the status and trends of ambient air quality; to ascertain whether the prescribed ambient air quality standards are violated; to identify non-attainment villages; to obtain the knowledge and understanding necessary for developing preventive and corrective measures and to understand the natural cleansing process undergoing in the environment through pollution dilution, dispersion, wind based movement, dry deposition, precipitation and chemical transformation of pollutants generated.

Under NAMP, three air pollutants, namely sulphur dioxide (SO₂), nitrogen dioxide (NO₂), and respirable suspended particulate matter (PM₁₀) have been identified for regular monitoring at all the locations. The monitoring of meteorological parameters, such as wind speed and wind direction, relative humidity (RH) and temperature are also targeted to be included in the monitoring of air quality.

8.2 Particulate Matter (PM₁₀) Concentration (Core Indicator)

8.2.1 General

The evidence on airborne Particulate Matter (PM) and its public health impact is consistent in showing adverse health effects at exposures that are currently experienced by urban populations in both developed and developing countries. PM pose a health concern because they can be inhaled into and accumulate in the respiratory system. People with heart or lung disease, older adults, and children are considered at greater risk to particle pollution. Long-term exposures (annual mean) to particles, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems, such as reduced lung function and the development of chronic bronchitis and even premature death. Short-term exposures (24 h) to particles can aggravate lung diseases, causing asthma attacks and acute bronchitis, and may also increase susceptibility to respiratory infections.

8.2.2 Core Indicator Requirements

Particulate Matter (PM_{10}) concentration shall be calculated as the total mass of collected particles in the PM_{10} size range (numerator) divided by the volume of air sampled (denominator). The result shall be expressed as the concentration of PM_{10} in micrograms per cubic metre ($\mu g/m^3$).

The method for measurement shall involve the use of an air sampler which draws ambient air at a constant flow rate $(1m^3/min)$ into a specially shaped inlet where the suspended particulate matter is initially separated less than or equal of PM₁₀ size range. The 24 hourly (daily) measurements of PM₁₀ concentrations are computed and data is 24 hourly and annually compiled for each monitoring stations.

NOTE — Particulate matter is a mixture of microscopic solids and liquid droplets suspended in air. These particulates are made up of a number of components, including acids (such as nitrates and sulphates), organic chemicals, metals, soil or dust particles, and allergens (such as fragments of pollen or mould spores). Coarse particles are greater than 2.5 microns and less or equal to 10 microns in diameter and are defined as 'respirable particulate matter' or PM₁₀.

Sources of coarse particles include crushing or grinding operations, and dust from paved or unpaved roads.

8.2.3 Data Source:

See **8.1.3**.

8.3 Nitrogen Dioxide (NO₂) Concentration (Supporting Indicator)

8.3.1 General

Nitrogen dioxide (NO₂) is a major air pollutant, which can have significant impacts on human health and the environment. NO₂ contributes to the formation of photochemical smog and at raised levels can increase the likelihood of respiratory problems. Nitrogen dioxide inflames the lining of the lungs, and it can reduce immunity to lung infections. This can cause problems such as wheezing, coughing, colds, flu and bronchitis. Increased levels of nitrogen dioxide can have significant impacts on people with asthma because it can cause more frequent and more intense attacks. NO₂ chemically transforms into nitric acid and contributes to acid rain. Nitric acid can corrode metals, fade fabrics, and degrade rubber. When deposited, it can also contribute to lake acidification and can damage trees and crops, resulting in substantial losses.

8.3.2 Supporting Indicator Requirements

NO₂ concentration shall be calculated as the sum of daily concentrations for whole year (numerator) divided by 365 days (denominator). The result shall be expressed as the annual average for daily NO₂ concentration, in μ g/m³. The daily concentrations shall be determined by averaging the hourly/4 hourly concentrations throughout a 24 h period from all monitoring stations within the village.

The method for measurement shall involve the use of an air sampler, which draws ambient air at a constant flow rate $(1m^3/min)$ into especially designed gaseous attachment or inlet where the nitrogen dioxide is absorbed initially and analysed in the laboratory. The 1 hourly/4 hourly measurements or 24 hourly (daily) measurements of NO₂ concentrations are computed and data is 24 hourly and annually compiled for each monitoring stations.

8.3.3 Data Source:

See **8.1.3**.

8.4 Sulphur Dioxide (SO₂) Concentration (Supporting Indicator)

8.4.1 General

Sulphur dioxide (SO₂) is a major air pollutant, which can have significant impacts on human health and the environment. Health effects caused by exposure to high levels of SO₂ include breathing problems, respiratory illness, changes in the lung's defenses, and worsening respiratory and cardiovascular disease. People with asthma or chronic lung or heart disease are the most sensitive to SO₂. It also damages trees and crops. SO₂, along with nitrogen oxides, are the main precursors of acid rain. This contributes to the acidification of lakes and streams, accelerated corrosion of buildings, reduced visibility and deforestation. SO₂ also causes formation of microscopic acid aerosols, which have serious health implications as well as contributing to climate change.

8.4.2 Supporting Indicator Requirements

Sulphur dioxide concentration shall be calculated as the sum of daily concentrations for the whole year (numerator) divided by 365 days. The result shall be expressed as the annual average for daily SO₂ concentration, in $\mu g/m^3$. The daily concentration shall be determined by averaging the hourly/four hourly concentrations throughout a 24 h period from all monitoring stations within the village.

The method for measurement shall involve the use of an air sampler, which draws ambient air at a constant flow rate $(1m^3/min)$ into especially designed gaseous attachment or inlet where the SO₂ is absorbed initially and analysed in the laboratory. The 1 hourly/4 hourly measurements or 24 hourly (daily) measurements of SO₂ concentrations are computed and data is 24 hourly and annually compiled for each monitoring stations.

8.4.3 Data Source

See **8.1.3**.

8.5 Ozone (O₃) Concentration (Supporting Indicator)

8.5.1 General

High concentrations of ozone (O_3) in the ambient air are harmful for humans as well as plants. High concentrations of ozone can irritate the respiratory system and are linked to asthma, bronchitis and heart attacks. The elderly are especially vulnerable.

NOTE —There are links being made to ozone concentration and environmental justice, in particular with reference to underprivileged social groups with higher exposure and vulnerability.

8.5.2 Supporting Indicator Requirements

Ozone (O₃) concentration shall be calculated as the sum of daily concentrations for the whole year (numerator) divided by 365 days (denominator). The result shall be expressed as the annual average for daily O₃ concentration in μ g/m³. O₃ is normally monitored at 8 h intervals. To determine the 24 h average daily concentration, the three 8 hourly concentrations shall be determined and averaged over a 24 h period at all monitoring stations within the village boundaries.

8.5.3 Data Source

See 8.1.3.

8.6 Green House Gas Emissions Measured in Tonnes per Capita (Core Indicator)

8.6.1 General

The greenhouse gas (GHG) emissions from all activities within the village are an indicator of the adverse contribution the village is making to climate change. Gases that trap heat in the atmosphere are called greenhouse gases. The most abundant GHG in Earth's atmosphere are:

a) Water vapour (H₂O),

- b) Carbon dioxide (CO₂),
- c) Methane (CH₄),
- d) Nitrous oxide (N₂O),
- e) Ozone (O₃), and

f) Chloro-fluorocarbons (CFCs).

The major sources of Greenhouse Gases (GHG) are as follows:

- a) Carbon Dioxide (CO₂) Carbon dioxide enters the atmosphere through burning fossil fuels (coal, natural gas and oil), solid waste, wood, and also as a result of certain chemical reactions and industrial processes (for example, manufacture of cement). Carbon dioxide is removed from the atmosphere (or 'sequestered') when it is absorbed by plants as part of the biological carbon cycle.
- b) *Methane (CH*₄) Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- c) *Nitrous Oxide (N*₂*O)* Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- d) Fluorinated Gases Hydrofluorocarbons (HFC), perfluorocarbons, sulphur hexafluoride, and nitrogen tri-fluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for stratospheric ozone-depleting substances (for example, chlorofluorocarbons, HFCs, and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases (High GWP gases).

8.6.2 Core Indicator Requirements

The greenhouse gas emissions measured in tonnes per capita shall be measured as the total amount of greenhouse gases in tonnes (equivalent carbon dioxide units) generated over a calendar year by all activities within the village, including indirect emissions outside village boundaries (numerator) divided by the current village population (denominator). The result shall be expressed as the total greenhouse gas emissions per capita in tonnes.

The total aggregate tonnage (expressed as equivalent carbon dioxide units of greenhouse gas) of greenhouse gas emissions shall be calculated for all activities within the village for the preceding 12 months.

The Global Protocol for Community-Scale GHG Emissions (GPC), (2012 Accounting and Reporting Standard) refers to a multi-stakeholder consensus-based protocol for developing international recognized and accepted community-scale greenhouse gas accounting and reporting. This protocol defines the basic emissions sources and categories within sectors for a community-scale GHG inventory, in order to standardize GHG inventories between communities and within a community over time. The protocol provides accounting methodologies and step-by-step guidance on data collection, quantification, and reporting recommendations for each source of emissions.

Both emissions sources and sector categorizations reflect the unique nature of villages and their primary emissions sources. These include emissions from: (a) Stationary units, (b) Mobile units, (c) Waste, and (d) Industrial process and product use sectors. DRAFT FOR COMMENTS ONLY

For further specifications, refer to the full GPC methodology. Local bodies are expected to provide information (that is quantified emissions) for each of these emission sources.

In order to address the issue of inter-village sources of emissions that transcend more than one jurisdictional body, the GPC integrates the GHG protocol scope definitions, as follows:

- a) Scope 2 emissions Energy-related indirect emissions that result as a consequence of consumption of grid-supplied electricity, heating and/or cooling, within the community's geopolitical boundary.
- b) *Scope* 3 *emissions* All other indirect emissions that occur as a result of activities within the community's geopolitical boundary.

For step-by-step guidance on data and accounting collection, see section 3 of the GPC.

NOTE — Greenhouse gases (GHGs) are gases in the atmosphere that absorb infrared radiation that would otherwise escape to space; thereby contributing to rising surface temperatures. There are six major GHGs: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆). The warming potential for these gases varies from several years to decades to centuries.

Users may also consult the IS/ISO 14064 series of standards on *greenhouse gases* for further guidance.

8.6.3 Data Source

See MOEF&CC website to get the data under National Programme on Climate Change & India's Initial National Communication (NATCOM).

8.7 Air Quality Index (Core Indicator)

8.7.1 General

Air Quality Index (AQI) is a tool for effective communication of air quality status in terms, which are easy to understand. It transforms complex air quality data of various pollutants into a single number (index value), nomenclature and colour.

8.7.2 Supporting Indicator Requirements

AQI is based on sub-index and health breakpoints evolved for eight pollutants (PM₁₀, PM_{2.5}, NO₂, SO₂, CO, O₃, NH₃ and Pb). Based on the measured ambient concentrations of a pollutant, sub-index is calculated, which is a linear function of concentration (for example, the sub-index for PM_{2.5} is 51 at concentration 31 μ g/m³, 100 at concentration 60 μ g/m³, and 75 at concentration of 45 μ g/m³). The worst sub-index determines the overall AQI. AQI is calculated only if data are available for minimum three pollutants out of which one should necessarily be either PM_{2.5} or PM₁₀.

8.7.3 Data Source

See 8.1.3.

8.8 Noise Pollution (Core Indicator)

8.8.1 General

Prolonged exposure to ambient noise from various sources, such as industrial activity, construction activity, fire crackers, sound producing instruments, generator sets, loud speakers, public address systems, music systems, vehicular horns and other mechanical devices have deleterious effects on human health and the psychological well-being of the people. To regulate noise pollution, specific provisions have been made under the *Noise Pollution (Regulation and Control) Rules, 2000.*

NOTE — Another useful indicator of the noise levels in a village is the degree of annoyance as specified in ISO/TS 15666 : 2021 'Acoustics — Assessment of noise annoyance by means of social and socio-acoustic surveys' This document provides specifications for socio-acoustic surveys and social surveys which include questions on noise effects (referred to hereafter as "social surveys"). It includes questions to be asked, response scales, key aspects of conducting the survey, and reporting the results.

8.8.2 Core Indicator Requirements

Noise pollution shall be calculated by mapping the noise level, L (day-evening-night) likely to cause annoyance as given in ISO 1996-2 : 2017 'Acoustics — Description and measurement of environmental noise — Part 2: Acquisition of data pertinent to land use' identifying the areas of the village where L is greater than 55 dB(A) and estimating the population of those areas as a percentage of the total village population. The result shall be expressed as the percentage of the population affected by noise pollution.

Users of this standard should note that noise pollution can also be recorded as L (night) and when exceeding 50 dB(A) is likely to cause sleep deprivation.

The Noise Pollution (Regulation and Control) Rules, 2000 defines the upper limits for noise pollution in the ambient air. The State Government, local bodies and other authorities are notified for enforcing these standards.

8.8.3 Data Source

Average concentrations are measured by monitoring equipment and reported to air quality monitoring authority (such as the local/ national/ state environment office, etc), notified by the states under the Noise Pollution (Regulation and Control) Rules, 2000.

8.9 Quality of Public Water Bodies (Core Indicator)

8.9.1 General

This indicator aims at determining the quality of water of public sources, such as rivers, lakes, ponds and sub-soil water bodies in the village. Water pollution is an increasing concern as water is a scarce resource and hence measuring and keeping a check on water quality becomes important so that the water health is maintained for intended purposes including for propagation of wild life and fisheries.

8.9.2 Core Indicator Requirements

The water quality monitoring network needs to be established with the help of central and state pollution control boards which covers ground waters and surface water encompassing rivers, lakes, tanks, ponds, creeks/ sea water, canals, drains, water treatment plants and wells.

The Central and State Pollution Control Boards have defined the standards for water quality for variety of purposes including for drinking, outdoor bathing, propagation of wild life and fisheries and controlled disposal. It has developed water quality index for the purpose.

8.9.3 Data Source

Central and state pollution control boards and committees have set up water quality monitoring stations at various locations. Villages can take the help of these organizations to undertake monitoring of water quality of the village water bodies.

NOTE — At times, specialized agencies are created to look after the village water bodies.

8.10 Pest infestation (Supporting Indicator)

8.10.1 General

This indicator aims at determining the extent to which the village faces the challenge of Pest infestation, which affects not only the agriculture sector, but also the quality if living of the inhabitants.

NOTE — Pest infestation usually occurs seasonally.

8.10.2 Supporting Indicator Requirements

Pest infestation shall be calculated as the total area of the village that reported the incidence of pest infestation in Hectares, divided by the total cultivable area of the village in Hectares. The result shall then be multiplied by 100 and expressed as a percentage.

8.10.3 Data Source

Pest infestation being occasional and seasonal incidence, is usually not subjected to regular data collection. Hence, as soon as the problem gat reported, the Local Agriculture Department officials undertake land surveys, to identify the incidences and extent of the infestation.

Figures for total cultivable are usually available with Agriculture Extension Workers at the village level.

8.11 Role of Pollinating species in agriculture (Supporting Indicator)

8.11.1 General

Pollination is the transfer of pollen from the producing anthers to the receptive stigma in flowering plants. Pollinating species provide food, form habitats and provide a wide range of other resources for many animal species. Pollinators consequently play a key role in regulating ecosystem services supporting food production, habitats and natural resources. Pollination management can affect the agronomic and economic yields, fruit quality (for example, size, sugar content, flavour and nutritional content), seed quality (for example, germination rate, oil content), market value and profitability, and the environmental impact of cropping.

The United Nations Framework Convention on Climate Change (UNFCCC) through the 6th Meeting of the Conference of Parties (COP 6, November 2000) had highlighted

the need to strengthen the International Initiative for the Conservation and Sustainable Use of Pollinators. The succeeding Meetings of COP over subsequent years have consistently encouraged all countries to encourage pollination initiatives for promotion of sustainable agriculture and diversifying the agricultural landscape.

8.11.2 Supporting Indicator Requirements

Pest infestation shall be calculated as the total area of the village that reported the

Pollination level can be precisely measured as the number of compatible and viable pollen grains that reach a stigma during the effective pollination period, and it is therefore directly related to yield for all crops in which the output is a product of sexual reproduction.

Comparing crop responses under pollination levels resulting from current practices with those from enhanced pollinator abundance or diversity will indicate the presence, and degree, of a pollination deficit. The protocol is structured as a hypothesis that there is a relationship between the pollination level X, the independent variable, and a part or the whole of crop yield Y, the dependent variable, as reflected in the following equation:

Y = F(X) + a

where:

Y is the total crop yield measured in agronomic or economic units;

F(X) is the yield resulting from the level of pollination service X, and is measured in the same unit as Y; and

A is the yield resulting from autonomous self-pollination and wind pollination measured in the same unit as Y.

NOTE— The above protocol is prescribed by the Food & Agriculture Organisation (FAO) and is available in their website.

8.11.3 Data Source

The data on the total crop yield measured in agronomic or economic units (Y) is usually available with the Agriculture and Horticulture Departments at village level upward.

However, the data on the yield resulting from the level of pollination service (X) shall need to be secured through surveys.

Similarly, the data on the yield resulting from autonomous self-pollination and wind pollination (A) shall also need to be secured through surveys.

9 FINANCE

9.1 Debt Service Ratio (Debt Service Expenditure as a Percentage of Panchayat's Own-Source Revenue) (Core Indicator).

9.1.1 General

This indicator is widely accepted as a measure of sound financial management and reflects the amount of financial resources that are available for day-today operations and how much money is spent paying down debt. It can be a controllable cost and can assist in priority setting.
9.1.2 Core Indicator Requirements

Debt service ratio is the ratio of debt service expenditure as percent of a panchayat's own source revenue. Debt service ratio shall be calculated as the total long term debt servicing costs including lease payments, temporary financing and other debt charges (numerator) divided by total own-source revenue (denominator). The result shall then be multiplied by 100 and expressed as a percentage of debt service expenditure as a percent of a panchayat's own-source revenue.

Total own source revenue shall be calculated as the total revenue less transfers.

9.1.3 Data Source

The annual budget of the panchayat would provide information on the outstanding debt liability and the provisions made/required for debt-servicing. The information can be cross-verified with the annual audit reports.

9.1.4 Data Interpretation

A lower number may indicate either an increased ability to borrow or a decision by a panchayat to limit its debt to enable funding of other service areas.

Care must be used in evaluating this indicator. A high debt-service ratio may indicate a panchayat that has taken on too much debt but it may also indicate that the panchayat has taken an aggressive approach to debt repayment and is paying down their debt quickly. Similarly, a low debt service ratio could indicate a panchayat is strong financially and can finance most capital projects through alternative funding sources. It may also indicate that a panchayat is financially weaker and has deferred capital projects and allowed important infrastructure to deteriorate.

9.2 Capital Spending as a Percentage of Total Expenditure (Supporting Indicator)

9.2.1 General

The amount of capital expenditure by the village/panchayat expressed as a percentage of the total village/panchayat expenditure is an indicator of capital reinvestment and the fiscal health of the village.

9.2.2 Supporting Indicator Requirements

The capital spending as a percentage of total expenditures shall be calculated as the total expenditure on fixed assets in the preceding year (numerator) divided by the total expenditure (operating and capital) (denominator) by the village/panchayat in the same period. The result shall then be multiplied by 100 and expressed as a percentage of capital spending as a percent of total expenditure.

NOTE — Fixed assets are not expected to be consumed or converted into cash in the normal course of business. These are long-term, more permanent or 'fixed' items, such as land, building, equipment, fixtures, furniture, and leasehold improvements.

9.2.3 Data Source

The figures used in this calculation should be taken directly from the village/panchayat's annual budget and the audited financial statements.

9.2.4 Data Interpretation

This indicator needs to be considered in conjunction with the debt service ratio indicator to obtain an understanding of the village/panchayat's capacity to maintain its capital expenditure. The level of capital expenditure in relation to recurrent expenditure may reflect the village/panchayat's financial capacity to invest in capital items needed to support future growth and development.

9.3 Own-Source Revenue as a Percentage of Total Revenues (Supporting Indicator)

9.3.1 General

On a very basic level, this indicator measures the level of dependence of the village/panchayat on other levels of government for revenues to deliver its services to the public.

9.3.2 Supporting Indicator Requirements

Own-source revenue as a percentage of total revenues shall be calculated as the total amount of funds obtained through permit fees, user charges for village/panchayat services, and taxes collected for village purposes only (numerator), divided by all operating or re-occurring revenues including those provided by other levels of government transferred to the village/panchayat (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

Own-source revenue as a percentage of total revenues represent the percentage of local government revenues originating from fees, charges and taxes as permitted by law or legislation in relation to all revenues including those provided by other levels of government, which includes operating or re-occurring revenues determined through methods, such as formula driven payments or repatriation of income tax, grant donations from higher government levels including national or state governments and other types of financial transfers that may be tied to the delivery of specific services.

9.3.3 Data Source

See **9.2.3**.

9.4 Tax Collected as a Percentage of Tax Billed (Supporting Indicator)

9.4.1 General

Tax collection is a major source of income for all levels of government including the villages/panchayats. This indicator is intended to measure the effectiveness of a village/panchayat's financial management capabilities and to some extent is a proxy of the willingness of citizens to pay taxes.

9.4.2 Supporting Indicator Requirements

The tax collected as a percentage of tax billed measures the ratio of the actual tax collected to the mandated tax. It shall be calculated as the total revenues generated by tax collection (numerator) divided by the amount of taxes billed (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

9.4.3 Data Source

See 9.2.3.

10 GOVERNANCE

10.1 Voter Participation in Last Municipal Election (as a Percentage of Eligible Voters) (Core Indicator)

10.1.1 General

The percentage of the eligible voting population that voted in the last panchayat election is an indicator of the public's level of participation and degree of interest in local government.

10.1.2 Core Indicator Requirements

The voter participation in the last panchayat election shall be calculated as the number of persons that voted in the last panchayat election (numerator) divided by the panchayat population eligible to vote (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

A result of zero shall be indicated if there have been no municipal elections in the last five years and this shall be noted in the comments.

NOTES

1 Election laws have provided for 'None of the above (NOTA) option also, for a voter who does not wish to vote for any of the candidates listed on the ballot paper. Ratio of the voters who opted for the NOTA option, to the total number of voters who cast their votes (including the number of invalid votes) would give an indication of satisfaction of the citizens with the governance framework at the electoral levels.

2 There is a distinction between eligible to vote and registered to vote. This should be noted.

10.1.3 Data Source

Information should be obtained from the local election authorities.

10.1.4 Data Interpretation

This indicator will only reveal the level of participation, not the level of satisfaction of the population. In some cases, high rates of participation will mean that the population is not satisfied with its local government's leadership and actions.

10.2 Women as a Percentage of Total Elected to Village Level Offices (Core Indicator)

10.2.1 General

The percentage of women elected to village level office is a direct reflection of inclusiveness in governance.

10.2.2 Core Indicator Requirements

The number of women elected to village level office shall be calculated as the total number of elected village level positions held by women (numerator) divided by the total number of elected village level positions (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

The number of elected village level positions shall refer to the number of places on the village council or in village government that are directly or indirectly elected. This shall

include elected managerial roles, such as Council/Standing Committee Chairperson, where relevant.

NOTE — While there is a constitutional mandate to ensure a minimum of one-third of the seats to be reserved for women in the offices of chairperson of panchayats, some states have made provisions to provide higher percentage for women. In some villages, the percentage of women elected representatives is even higher than the constitutional minimum requirements.

10.2.3 Data Source

See 10.1.3.

10.3 Percentage of Women Employed in the Village Government Workforce (Supporting Indicator)

10.3.1 General

The percentage of the village government workforce that is women is a direct reflection of the equity of the hiring system within the village government.

10.3.2 Supporting Indicator Requirements

The number of women employed in the Panchayat workforce shall be calculated as the total number of employees in the Panchayat workforce that are women (numerator) divided by the total number of the Panchayat workforce (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

The Panchayat workforce shall be calculated as the total number of employees working within the Panchayat .

10.3.3 Data Source

Information should be obtained from the Panchayat offices.

10.4 Number of Convictions for Corruption by Village Officials per 1 000 Population (Supporting Indicator)

10.4.1 General

The principles of governance include selflessness, objectivity, accountability, openness, honesty and leadership. The number of convictions for corruption/ bribery can reflect the extent to which governance adheres to these core principles.

10.4.2 Supporting Indicator Requirements

The number of convictions for corruption by village officials shall be calculated as the total number of convictions for corruption by village officials (numerator) divided by one 1 000th of the village's total population (denominator).

Village officials are the elected representatives or employed officials of the Panchayat.

10.4.3 Data Source

Information should be obtained from the village government office.

10.5 Citizens' Representation: Number of Local Official Elected to Office per 100 000 Population (Supporting Indicator)

10.5.1 General

The number of public officials elected by citizens of the village and the right of citizens as guaranteed by law, to examine and then make submissions/objections to urban planning, development and infrastructure policies/ plans/projects prior to their approval/construction is an indicator of citizens' rights to participate in the affairs of their village.

10.5.2 Supporting Indicator Requirements

The number of local officials elected to office per 100 000 shall be calculated as the total number of public officials elected to local office by citizens of the village (numerator) divided by one 100 000th of the village's total population (denominator). The result shall be expressed as the number of local officials elected to office per 100 000 population.

The term 'public officials elected to local office by citizens of the village' shall include all positions in the public service relating to the village that require election by the citizens of the village to hold office. It includes all councils, boards, commissions, etc. where members are elected by the citizens of the village but does not include national or state government politicians.

NOTE — This indicator only reveals the number of local officials elected to office and does not determine whether or not citizens have the right, guaranteed by law, to examine and then make submissions/ objections to local planning, development and infrastructure policies/plans/projects prior to their approval/construction. It is codified and enforceable law of the village that guarantees citizens the right to examine and then make submissions/objections to urban planning, development and infrastructure policies/plans/projects prior to their approval/construction in order for the villages to report that this element of the citizens' participation exists in their village. Whether these rights exist should be noted.

10.5.3 Data Source

See 10.1.3.

10.5.4 *Comments and Limitations*

An increase in the number of elected village officials and/ or village level workers may in some circumstances indicate an expensive village administration.

10.6 Number of Registered Voters as a Percentage of the Voting Age Population (Supporting Indicator)

10.6.1 General

Determining the percentage of the number of registered voters from the voting age population can reveal the legitimacy and quality of the electoral process in a village. For citizens to exercise their democratic right to vote there must be a comprehensive and inclusive electoral register, also called a voters list; and this must be carefully maintained to ensure that each eligible citizen is registered to vote once and only once. A voters' list makes it possible to separate two of the most important functions of the election authority: verifying voter eligibility and controlling the legitimacy of the balloting process.

10.6.2 Supporting Indicator Requirement

The number of registered voters as a percentage of the voting age population shall be calculated as the total number of registered voters, as determined by the official voter

register (numerator) divided by the voting age population (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

Number of registered voters shall refer to the number of names on the voters' register at the time that the registration process closes (cut-off date), as reported by the election authority. The election authority should use one of three options for voter registration: a periodic list, a continuous register/list, or a civil registry. Any one of these options can determine the number of registered voters.

Voting age population shall include all citizens of legal voting age.

NOTE — Voting age population is not necessarily an exact measure of the number of citizens entitled to vote as it does not take into account legal or systemic barriers to the exercise of the franchise or account for non-eligible members of the population, such as resident noncitizens or in some jurisdictions persons serving a sentence of imprisonment in a penal or correctional institution [the voting eligible population (VEP) would capture these discrepancies but it is very hard to achieve the data required to measure VEP].

10.6.3 Data Source

See 10.1.3.

11 HEALTH

11.1 Average Life Expectancy at Birth (Core Indicator)

11.1.1 General

Life expectancy at birth measures the average number of years a person is expected to live under prevailing mortality conditions. Life expectancy at birth is closely connected with health conditions, which are an integral part of development. Mortality is also one of the variables that determine the size of human populations and their potential for future growth. Life expectancy at birth is also a measure of overall quality of life in a country and summarizes mortality at all ages. It can also be thought of as indicating the potential return on investment in human capital and is necessary for the calculation of various actuarial measures.

11.1.2 Core Indicator Requirements

The average life expectancy at birth shall be calculated as the average number of years to be lived by a group of people born in the same year, if health and living conditions at the time of their birth remained the same throughout their lives.

11.1.3 Data Source

In India, life expectancy at various broad age groups has been estimated through Sample Registration System (SRS) conducted by the Census Commissioner of India. However, SRS data is available only for the states but not for the villages, owing to sampling methodology adopted. Villages will need to make assessment of life expectancy through expert agencies.

NOTE —The life tables generated under SRS are based on the mortality package for life table estimation (MORTPAK 4), which is a United Nation's software package for mortality measurements.

11.2 Under Age Five Mortality per 1 000 Live Births (Core Indicator)

11.2.1 General

The under age five mortality rate is a leading indicator of the level of child health and overall development in villages. Child mortality is an indicator of the status of the village as a healthy or unhealthy place to live. In addition, mortality rates are among the most frequently used indicators to compare levels of socio-economic development across countries. Improving child mortality rates is a vital component of the Sustainable Development Goals.

11.2.2 Core Indicator Requirements

The under age five mortality per 1 000 live births shall refer to the probability of a child born in a specified year dying before reaching the age of five, and shall be expressed as a rate per 1 000 live births.

NOTE — The under age five mortality rate, is strictly speaking, not a rate (that is the number of deaths divided by the number of population at risk during a certain period of time) but a probability of death derived from a life table and expressed as rate per 1 000 live births.

Age-specific mortality rates among children and infants shall be calculated from birth and death data derived from vital registration, census, and/or household surveys. Estimates based on household surveys data shall be obtained,

a) directly, using birth history, as in demographic and health surveys, or

b) indirectly, using the Brass method, as specified in the Multiple Indicator Cluster Surveys.

The data shall then be summed for children under age five and shall be expressed as a rate per 1 000.

The under age five mortality per 1 000 live births should be computed for boys, girls and the total population of children of this age group, to facilitate understanding of gender bias.

11.2.3 Data Source

The Registration of *Births and Deaths Act,* 1969 requires the state governments to appoint Registrars for compulsory registration of all births and deaths in their respective local areas. Usually, an officer of the local body (municipality, panchayat, cantonment board, etc.) is appointed as the Registrar. Data on births and deaths may be secured from the Registrar.

NOTE — It would be desirable to ascertain the list of all the authorized Registrars in the village and secure data from all of them.

11.3 Number of In-Patient Hospital Beds per 1 000 Population (Core Indicator)

11.3.1 General

The number of in-patient public hospital beds is one of the few available indicators, which monitor the level of a health service delivery. Service delivery is an important part of health systems, and in-patient public hospital bed density is one of the few indicators that can be collected.

11.3.2 Core Indicator Requirements

The number of in-patient hospital beds per 1 000 shall be calculated as the total number of in-patient public and private hospital beds (numerator), divided by 1 000th of the village's total population (denominator). The result shall be expressed as the number of inpatient public and private hospital beds per 1 000 of the village population.

Hospital beds shall include in-patient and maternity beds. This shall include beds in wards, which are closed for reasons, such as lack of health staff, and building works. It shall also include beds for patients admitted who require continual assistance, incubators and specialized care. It may not include day care beds, pre-anaesthesia beds, wake-up beds, beds for members of a patient's family, and beds for hospital staff.

11.3.3 Data Source

This indicator should rely on administrative records, based on reported data by public inpatient facilities. Data may also come from censuses of health care facilities. A prominent data source is the Health Management Information System (HMIS), which is a Government to Government (G2G) web-based Monitoring Information System that has been put in place by Ministry of Health & Family Welfare (MoHFW), Government of India to monitor the National Health Mission and other Health programmes and provide key inputs for policy formulation and appropriate programme interventions. HMIS captures facility-wise information on Infrastructure (Manpower, Equipment, Cleanliness, Building, Availability of Medical Services such as Surgery etc., Super Specialties services such as Cardiology etc., Diagnostics, Para Medical and Clinical Services etc. data) on monthly basis. HMIS data is compiled at Block, District, State and National levels. However, facility-level data, aggregating to village and panchayat levels, can possibly be secured with proper authorisation.

11.4 Number of Physicians per 1 000 Population (Core Indicator)

11.4.1 General

The availability of physicians is an important indicator of the strength of a village's health system. There is evidence that the number of physicians is positively associated with immunization coverage, outreach of primary care, and infant, child and maternal survival. In this standard, physicians may also be referred to as doctors.

11.4.2 Core Indicator Requirements

The number of physicians per 1 000 population shall be calculated as the number of general or specialized practitioners whose workplace is in the village (numerator) divided by one 1 000th of the village's total population (denominator). The result shall be expressed as the number of physicians per 1 000 population.

For this indicator, a physician shall be defined as someone who graduates from any facility or school of medicine whose workplace is in the village.

Full-time equivalence (FTE) shall be applied, in order to capture doctors working parttime in hospitals and in practices.

11.4.3 Data Source

Villages and Panchayats should report the number of physicians based on administrative records, such as physicians registered with the Medical Council of India in the Village/ Panchayat. Information may also be obtained from the census, labour force statistics or other surveys, which inquire about occupation. HMIS referred to **11.3.3** can also be a source of information in many cases. The villages that impose professional tax, can use the tax-database to source this information.

The accuracy and completeness of the human resource data can be a problem because databases are not updated frequently, private sector data are often not

included and definitions of workers vary. It is for this reason that yearly updated data sources, such as administrative records, should be used. The definition presented above shall be the definition used when gathering data to report on this indicator.

11.5 Number of Dentists per 5 000 population (Core Indicator)

11.5.1 General

There is a strong relationship between oral and general health. Examination of the oral health by a dentist can show signs of nutritional deficiencies or systemic conditions, such as diabetes, and oral infections can be risk factors for diseases like cardiovascular diseases. Therefore, the availability of dentists is an important indicator for the well-being of the residents of a community. As per WHO Norms, there should be one dentist per 5 000 population. This norm has been achieved in India for the country as a whole. However, availability of dentists in the rural areas is quite inadequate and needs attention.

11.5.2 Core Indicator Requirements

The number of dentists per 5 000 population shall be calculated as the number of general or specialized dental practitioners whose workplace is in the village (numerator) divided by one 5 000th of the village's total population (denominator). The result shall be expressed as the number of dentists per 5 000 population.

NOTES

1 For this indicator, a dentist shall be defined as someone who graduates from any facility or school of dental science/medicine, and whose workplace is in the village.

2 Full-time equivalence (FTE) shall be applied, in order to capture doctors working part-time in hospitals and in practices.

3 Qualified dentists working in non-government sectors in the village should also be counted,

11.5.3 Data Source

Villages and Panchayats should report the number of dentists based on administrative records, such as dentists registered with the Dental Council of India in the Village/ Panchayat. Information may also be obtained from the District Health Office, census, labour force statistics or other surveys, which inquire about occupation. HMIS referred to 10.3.3 can also be a source of information in many cases. The villages that impose professional tax, can use the tax-database to source this information.

NOTE — The accuracy and completeness of the human resource data can be a problem because databases are not updated frequently, private sector data are often not included and definitions of workers vary. It is for this reason that yearly updated data sources, such as administrative records, should be used. The definition presented above shall be the definition used when gathering data to report on this indicator.

11.6 Number of Disabled Persons per 1 000 Population (Supporting Indicator)

11.6.1 General

Every village should aim to be an inclusive society in which equal opportunities and access are provided for the growth and development of the persons with disabilities (PwDs) to lead productive, safe and dignified lives.

Accordingly, the village should have the details about the number of PwDs and their social and economic status, which should enable the village administration to provide for social and physical infrastructure for them commensurate with requirements of barrier free environment.

11.6.2 Supporting Indicator Requirements

The number of disabled persons per 1 000 population shall be calculated as the number of disabled persons residing in the village (numerator) divided by 1 000th of the village's total population (denominator). The result shall be expressed as the number of disabled persons per 1 000 population.

Disability has been defined under the *Rights of Persons with Disabilities Act*, 2016 and covers impairments relating to blindness and low vision; deaf and hard of hearing; locomotor disability including cerebral palsy, leprosy cured, dwarfism, acid attack victims and muscular dystrophy; autism, intellectual disability, specific learning disability and mental illness; etc.

11.6.3 Data Source

Data on the PwDs is available in the decennial census. Villages/Panchayats can update the same through specific surveys with norms provided by the State Government, for the purposes of uniformity.

11.7 Number of Nursing and Midwifery Personnel per 1 000 Population (Supporting Indicator)

11.7.1 General

The number of nursing and midwifery personnel is a good indication of the village's health system and the strength of its outreach for maternal health.

11.7.2 Supporting Indicator Requirements

The number of nursing and midwifery personnel shall be calculated as the total number of nurses and midwives (numerator), divided by one 1 000th of the village's total population (denominator). The result shall be expressed as the number of nursing and midwifery personnel per 1 000 population.

The number of nurses shall include actively practicing nurses and midwives employed in public and private hospitals, clinics and other health facilities, including selfemployed nurses and midwives. Both fully qualified nurses with post-secondary education in nursing and vocational/ associate/ auxiliary/ practical nurses with a lower level of nursing skills but also usually registered, shall be reported.

NOTE — Some figures may be underestimated or overestimated when it is not possible to distinguish whether the data includes health workers in the private sector, double counts of health workers holding two or more jobs at different locations, health service providers working outside the health care sector (for example, nurses working in a school or large private company), workers who are unpaid or unregulated but performing health care tasks (for example, volunteer community health workers) or people with health vocational training who are not currently engaged in the national health labour market (for example, unemployed, migrated, retired or withdrawn from the labour force for personal reasons).

11.7.3 Data Source

Data on the number of nursing and midwifery personnel in a village can be obtained from the District Health & Family Welfare Office.

11.8 Suicide Rate per 1 000 Population (Supporting Indicator)

11.8.1 General

Suicide rate is a serious issue in many villages and reflects on mental health in a village, which is central to human development.

11.8.2 Supporting Indicator Requirements

The number of deaths by suicide per 1 000 population shall be calculated as the total number of reported deaths by suicide (numerator) divided by 1 000th of the village's total population (denominator). The result shall be expressed as the number of deaths by suicide per 1 000 population.

Death by suicide shall refer to acts deliberately initiated and performed by a person who fully acknowledges the fatal outcome of such acts.

11.8.3 Data Source

The National Crime Records Bureau compiles state-wise information on accidental deaths and suicides in India (ADSI) and publishes the same annually on its website. This data is generated by the police station houses and compiled at district and state levels. The ADSI also contains city-wise information in respect of 53 cities having population of over 10 lakh. For other cities and all villages, police station/outpost-wise data can be consolidated to generate village level information.

11.9 Number of sub health centres per 10 000 Population (Supporting Indicator)

11.9.1 General

In the public sector, Sub Health Centres (SHCs) is the first point of contact between the primary health care system and the community, providing all the primary health care services. It is the lowest rung of a referral pyramid of health facilities consisting of the Sub-centres, Primary Health Centers, Community Health Centres, Sub-Divisional/Sub-District Hospitals and District Hospitals. The purpose of the Health Subcentre is largely preventive and promotive, but it also provides a basic level of curative care.

As per norms of Indian Public Health Standards (IPHS) 2022 (Volume IV), there shall be one SHC established for every 5000 population in plain areas and for every 3000 population in hilly/tribal/desert areas.

As per IPHS 2022, a Sub Heath Centre should have one Community Health Officer (CHO), one Auxiliary Nurse Midwife (ANM) and a Multi-PurposeWorker (MPW) (Male) or two ANMs, and support staff. The Accredited Social Health Activist (ASHA) should be attached with the SHC as part of the entire team.

NOTE — There should be one ASHA per 1000 population or one ASHA per habitation in tribal, hilly and desert areas.

11.9.2 Supporting Indicator Requirements

The number of sub health centres per 10 000 Population shall be calculated as the total number of such institutions in the village (numerator), divided by one 10 000th of the village's total population (denominator). The result shall be expressed as the number of sub health centres per 10 000 population.

11.9.3 Data Source

The Rural Health Statistics, published annually by the Ministry of health & FW reports the data on PHCs/HWCs and various other infrastructure and facilities relating to the Health Sector. However, it does not present village-wise data. The village-wise data

on availability of sub health centres can be obtained from the District Health Office as well as Panchayat Office.

11.10 Number of primary health care centres, dispensaries and/or wellness centres per 1 00 000 Population (Supporting Indicator)

11.10.1 General

Primary Health Centres (PHCs) essentially deliver preventive, promotive, basic curative, palliative, and rehabilitative services encompassing community and programmatic requirements. Primary healthcare services in India have till now been delivered through Sub-centres and Primary Health Centres in rural areas and Urban Primary Health Centres in urban areas.

In February 2018, the Government of India announced 1,50,000 Ayushman Bharat-Health and Wellness Centres (AB-HWCs) to be established across the country by December 2022. The existing Sub- Health Centres (SHC), Primary Health Centres (PHC) and Urban Primary Health Centres (UPHC) are being transformed into AB-HWCs to deliver Comprehensive Primary Health Care (CPHC) that includes preventive, promotive, curative, palliative and rehabilitative services which are universal, free, and closer to the community.

The Indian Public Health Standards 2022 (Volume III) has prescribed availability of one PHC/HWC per 50,000 population for urban areas, per 30,000 population for rural areas and per 20,000 population for hill and tribal areas. The norms for service provision, infrastructural and human resource requirements, drugs, diagnostics and equipment, quality assurance, monitoring and governance are defined for all facilities in rural and urban areas. General guidance on these components is presented in the and the mechanism and criteria for IPHS certification can be accessed from their website.

11.10.2 Supporting Indicator Requirements

The number of primary health care centres, dispensaries and/or wellness centres per 1 00 000 Population shall be calculated as the total number of such institutions in the village (numerator), divided by one 1 00 000th of the village's total population (denominator). The result shall be expressed as the number of primary health care centres, dispensaries and/or wellness centres per 1 00 000 population.

The number of such centres shall include institutions run by private and voluntary organisations in the village. Such institutions should be duly recognised and registered with State Government or any other competent authority.

NOTE — Many villages have population score of less than one lakh. In such cases, this indicator can be appropriately used. for a group of villages, such as a Mandal or a Block.

11.10.3 Data Source

The Rural Health Statistics, published annually by the Ministry of health & FW reports the data on PHCs/HWCs and various other infrastructure and facilities relating to the Health Sector. However, it does not present village-wise data. The village-wise data on availability of PHCs/HWCs can be obtained from the District Health Office as well as Panchayat Office. Availability of Health Centres in non-government sectors can be obtained from the same sources.

11.11 Number of community health care centres per 1 00 000 Population (Supporting Indicator)

11.11.1 General

Community Healthcare Centres (CHCs) provide a wider range of services as compared to the Primary Health Centres. CHCs are provided in two categories, namely, the First Referal Unit (FRU) CHCs and non-FRU CHCs.

Non-FRU CHCs are those that provide essential services including preventive, promotive, curative, palliative, and rehabilitative services etc. Curative services include normal delivery, stabilisation of common emergencies, etc. Non-FRU CHCs in rural areas will have 30 essential beds.

FRU CHCs, in addition to the above services, provide specialised care, which can be rendered through specialists (physicians, surgeons, obstetricians, paediatricians, and anaesthesiologists) and the accompanying infrastructure (functional operation theatre and blood storage unit). Both elective and emergency surgical services of secondary level care shall be provided. FRU CHC in rural areas should have at least 50 beds, including 30 essential beds and additional beds for the specialised care.

Community Health Centre in rural areas (CHC) is to be established for a population norm of 80,000 in hilly and tribal areas and 1,20,000 in plains.

NOTE— CHCs in rural areas can be either non-FRU CHC or FRU CHC, whereas the CHCs in urban areas will function only as FRU CHCs.

11.11.2 Supporting Indicator Requirements

The number of community health centres per 1 00 000 Population shall be calculated as the total number of such institutions in the village (numerator), divided by one 1 00 000th of the village's total population (denominator). The result shall be expressed as the number of community health centres per 1 00 000 population.

NOTE— Many villages have population score of less than one lakh. In such cases, this indicator can be appropriately used. for a group of villages, such as a Mandal or a Block.

11.11.3 Data Source

The Rural Health Statistics, published annually by the Ministry of health & FW reports the data on CHCs and various other infrastructure and facilities relating to the Health Sector. However, it does not present village-wise or Block-wise data. The village-wise or Block-wise data on availability of community health centres can be obtained from the District

11.12 Number of veterinary doctors / institutions per 5000 Population (Supporting Indicator)

11.12.1 General

Livestock provide a backbone for the farming sector and are an essential compenent of the strategy for achieving food security. Veterinary Doctors/Centres (VCs) provide a wider range of services including surgery, treatment, and nursing to address most health concerns. A veterinarian gives suggestions with respect to diet, exercise, vaccines, and medications. Moreover, routine veterinary visits will also help in the early detection of diseases, thereby allowing timely intervention and helping pets and farm animals live happier, longer, and healthier lives, which would contribute to the economy of the farmers and the villages. According to norms set by the National Commission on Agriculture (1976), one veterinary doctor / institution is required for every 5,000 animals. The total livestock population in India is estimated to be about 53.58 crores (20th Livestock Census) which amounts to a requirement of about 1.07 lakh veterinary doctors / institutions.

11.12.2 Supporting Indicator Requirements

The number of veterinary doctors / institutions per 5 000 animals shall be calculated as the total number of such doctors / institutions in the village (numerator), divided by one 5 000th of the village's total animal population (denominator). The result shall be expressed as the number of community health centres per 5 000 population.

NOTES

1 Animals kept as pets or under foster care should also be included while counting the number of animals in the village.

2 Veterinary doctors / institutions working in non-government sectors should also be counted.

11.12.3 Data Source

The National Livestock Census provides reliable data on livestock population. However, it is conducted after some years only- the last was in 2019 and does not present village-wise or Block-wise data. The village-wise or Block-wise data on availability of veterinary doctors / institutions and of the animals can be obtained from the District Veterinary Office Office and the Village Panchayat Office.

11.13 Animal / bird health (Core Indicator)

11.13.1 The rural economy is significantly dependent on the availability of the animals, both for the on-farm and off-farm activities. Even the birds are engaged with the rural economy and ecology in many direct and indirect ways. Birds are excellent indicators of ecosystem condition because they are responsive to environmental change, have important ecological functions— such as seed dispersal and insect consumption, and are easy to observe.

It is, therefore, relevant to keep track of the health condition of the animals and the birds, for the farmers who own them, as well as for the village as a whole.

11.13.2 Core Indicator Requirements

The most common indicators of the health of the animals is the changes in an animal's behaviour such as isolation, loss of appetite, lethargy, etc., which can be the first indications of an illness or injury. More visible signs such as coughing, excessive salivation, diarrhoea, abortions, and neurological disorders (e.g., circling, head pressing, stumbling, blindness) are the indicators more serious health conditions.

For the birds, the indicators of ill-health include inactivity or lack of interest in surroundings, decreases or changes in vocalization or singing, sitting low on the perch, sitting on the bottom of the cage, weakness, losing balance, drooped or elevated wings, teetering, or falling off of perch, walking in circles, weight loss etc.

11.13.3 Data Source

The most common source of data for the status of the health and well-being of the animals and birds of a village or a panchayat is the local veterinary centre.

Of late, the Internet of Animals (IoA) has started gaining attention. IoA is a subsection of the Internet of Things (IoT). With the IoA, scientists equip animals and birds with

internet-tracking devices, often referred to as "smart tags," which allow researchers to track the movements, behaviours, and overall health of animals and birds in both the wild and domestic environments.

The data collected through these devices is then transmitted to researchers and other agencies concerned via the internet, providing valuable insights into the lives of these animals and birds.

12 HOUSING

12.1 Percentage of Village Population Living in Slums (Core Indicator)

12.1.1 General

Usually, slums are associated with the cities. However, the definition of a slum, as described in **12.1.2**, makes it possible to define slums for the villages also. The percentage of the population living in slums is an indicator of the number of the village residents living in sub-standard or insecure housing. Evidence shows that slums are growing and becoming permanent features of urban landscapes. One out of every five city dwellers lives in a slum today. Since it is desirable to provide a decent shelter for residents of villages, as much as for the cities, it is important to measure them for the villages as well.

12.1.2 Core Indicator Requirements

The percentage of village population living in slums shall be calculated as the number of people living in slums (numerator) divided by the village's total population (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

The data for number of people living in slums in each village does not form part of the decennial census. However, the Pradhan Mantri Awas Yojana- Gramin (PMAY-G) has been devised in line with Government's commitment to provide 'Housing for All' by 2022 in the rural areas. The scheme aims at providing a pucca house with basic amenities to all houseless householder living in kutcha and dilapidated houses by 2022.

The PMAY-G selects beneficiaries using housing deprivation parameters in the Socio Economic and Caste Census (SECC) 2011 data. The SECC data captures specific deprivation related to housing among households. Using the data, households that are houseless and living in 0,1,2 kutcha wall and kutcha roof houses can be segregated and targeted. The Permanent Wait list generated also ensures that states have ready list of households to be covered under the scheme in coming years (through Annual Select Lists) leading to better planning of implementation.

However, in case a village wishes to initiate a survey for identification of slums on an objective basis, it can adopt, with or without modifications, the legal definition of a 'Slum' as available in the *Slum Areas (Improvement and Clearance) Act*, 1956. Broadly speaking, a slum household refers to a group of individuals living under the same roof who lack one or more of the following five conditions:

a) Durable housing — A house is considered 'durable' if it is built on a non-hazardous location and has a structure permanent and adequate enough to protect its inhabitants from the extremes of climatic conditions, such as rain, heat, cold and humidity.

- b) *Sufficient living area* A house is considered to provide a sufficient living area for the household members if not more than three people share the same room.
- c) Access to improved water A household is considered to have access to improved water supply if it has a sufficient amount of water for family use, at an affordable price, available to household members without being subject to extreme effort, especially on the part of women and children.
- d) Access to sanitation A household is considered to have adequate access to sanitation if an excreta disposal system, either in the form of a private toilet or a public toilet shared with a reasonable number of people, is available to household members.
- e) Secure tenure Secure tenure is the right of all individuals and groups to effective protection against forced evictions. People have secure tenure when there is evidence of documentation that can be used as proof of secure tenure status or when there is either *de facto* or perceived protection against forced evictions.

Care should be taken to avoid double counting so as to not exaggerate or over-count the percentage of population in slums.

12.1.3 Data Source

As noted in **12.1.2**, the SECC data captures specific deprivation related to housing among households. Using the data, households that are houseless and living in 0,1,2 kutcha wall and kutcha roof houses can be segregated and targeted. However, if any new definition of a 'rural slum' is adopted, then a fresh survey would be called for.

12.2 Number of Homeless per 1 000 Population (Supporting Indicator)

12.2.1 General

Having a home to live in can be considered a basic need. There may be several reasons for a homeless situation, such as the housing price to income ratio.

12.2.2 Supporting Indicator Requirements

The number of homeless per 1 000 population shall be calculated as the total number of homeless people (numerator), divided by one 1 000th of the village's total population (denominator). The result shall be expressed as the number of homeless per 1 000 population.

The United Nations defines homelessness as 'Absolute homelessness refers to those without any physical shelter, for example, those living outside, in parks, in doorways, in parked vehicles, or parking garages, as well as those in emergency shelters or in transition houses for women fleeing abuse'.

In India, Census 2011 defines houseless households as 'Households which do not live in buildings or census houses but live in the open or road side pavements, in hume pipes, under fly-overs and staircases, or in the open in places of worship, mandaps, railway platforms, etc'.

The Socio Economic and Caste Census (SECC) 2011 data captures specific deprivation related to housing among households. Using the data, households that are houseless have been identified.

12.2.3 Data Source

Data for the above conditions should be gathered from census and survey data and information from agencies working with slums. Hwoeverm the data from SECC 2011 has been updated under the Pradhan Mantri Awas Yojana- Gramin (PMAY-G) and the updated data can be made use of.

12.3 Percentage of Households that Exist Without Registered Legal Titles (Supporting Indicator)

12.3.1 General

Understanding the percentage of households that exist without registered legal titles informs municipal leaders on housing security for village residents as well as housing conditions, infrastructure requirements and builds a better database for less formal parts of the village.

12.3.2 Supporting Indicator Requirements

The percentage of households that exist without registered legal titles shall be calculated as the number of households that exist without registered legal titles (numerator) divided by the total number of households (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

Unregistered legal title includes the following tenure types: unregistered lease or leaseholds, rental, occupancy right, use right (including sub-lease, subrental and co-tenancy, and co-occupancy right).

12.3.3 Data Source

Survey of Villages Abadi and Mapping with Improvised Technology in Village Areas (SVAMITVA), a Central Sector Scheme of Ministry of Panchayati Raj was nation-wide launched on 24th April 2021 after successful completion of pilot phase of scheme (2020-2021) in 9 states. Scheme is a reformative step towards establishment of clear ownership of property in rural inhabited ("Abadi") areas, by mapping of land parcels using drone technology and providing 'Record of Rights' to village household owners with issuance of legal ownership cards (Property cards/Title deeds) to the property owners. The Scheme is implemented with the collaborative efforts of the Ministry of Panchayati Raj, State Revenue Department, State Panchayati Raj Department and Survey of India.

Information on this indicator is expected to be available with the local panchayat.

12.4 Percentage of Slum Dwellers Having the Right to Tenure (Supporting Indicator)

12.4.1 General

Right to tenure would encourage the slum dwellers participate more actively in improvement of their shelter and the surroundings.

12.4.2 Supporting Indicator Requirements

The percentage of slum dwellers having the right to tenure shall be calculated as the total number of slum dwellers having the right to tenure (numerator) divided by the total number of slum dwellers (denominator) within the village.

12.4.3 Data Source

Data on number of slum dwellers having the right to tenure would be available in the decennial census documents. This may be updated from the local bodies.

In some cases, surveys can also be conducted.

NOTE — See 11.1 also.

13 RECREATION

13.1 Square Metres of Public Indoor Recreation Space per Capita (Supporting Indicator)

13.1.1 General

Recreation has always been an important aspect of village life, contributing to the health of citizens and the vitality of the village. Recreation is a service that many villages provide through local bodies or related office. It is recommended that this space is made accessible to the elderly, people with disabilities and wheelchair users in accordance with SP 7. Care should be taken to provide equal access to the females also.

13.1.2 Supporting Indicator Requirements

Square metres of public indoor recreation space per capita shall be calculated as the square metres of indoor public recreation space (numerator) divided by the population of the village (denominator), and shall be expressed as the number of square meters of indoor recreation space per capita.

NOTE — The need for indoor public recreational spaces varies depending on local climatic and cultural conditions.

Public recreation space shall refer to land and buildings open to the public for relaxation, amusement or leisure pursuits. Recreation space shall include only space that primarily serves a recreation purpose.

Indoor public recreation space should include,

- a) Panchayat or government-owned or maintained buildings; and
- b) other recreation buildings within the village not owned or operated by the village, provided they are open to the public. This category may include state or provincially owned buildings, schools and colleges, as well as non-profit organizations. If villages report only panchayat-owned recreation space, this shall be noted.

For multi-story buildings the floor area of all floors in the building should be counted, if known.

For multi-use facilities only the portion of the building devoted to recreation shall be counted (the play areas at a school or college, for example, not the entire school site).

The area of the entire recreation site shall be included (including, for example, building maintenance and utility areas) but shall exclude parking areas.

NOTE— Many villages report only panchayat-owned recreation space and do not include the contribution to recreation from non panchayat-owned facilities. While the methodology in this standard appears complex, the result will ultimately be more meaningful. It is recommended that a recreation space inventory be created.

13.1.3 Data Source

This information should be obtained from the Land Revenue department and the Panchayat together with departments knowledgeable about the village.

Recreation spaces may also be delineated using aerial photography and/or land use maps. Once the areas have been identified on a map, the area in square metres may be calculated using low cost Geographic Information Systems (GIS) or, if not available, through use of handheld measuring devices. Area may be calculated in hectares or acres and converted to square meters.

13.2 Square Metres of Public Outdoor Recreation Space per Capita (Supporting Indicator)

13.2.1 General

Recreation is an important aspect of village life, contributing to the health of citizens and the vitality of the village. Recreation is a service that many villages provide through local bodies related office. This will include outdoor recreation space. It is recommended that this space is made accessible to the elderly, people with disabilities and wheelchair users in accordance with SP 7.

13.2.2 Supporting Indicator Requirements

Square metres of public outdoor recreation space per capita shall be calculated as square metres of outdoor public recreation space (numerator) divided by the population of the village (denominator), and shall be expressed as the number of square meters of outdoor recreation space per capita.

Public recreation space shall refer to land and open space available to the public for relaxation, amusement or leisure pursuits. Recreation space shall include only space that primarily serves a recreation purpose.

Outdoor recreation space should include,

- a) Panchayat-owned or maintained land; and
- b) other-recreation lands within the village not owned or operated by the Panchayat, provided they are open to the public. This category may include state or provincially owned lands, school and college grounds, as well as non-profit organizations. If villages report only Panchayat-owned recreation space, this shall be noted.

For multi-use facilities, only the portion of the land devoted to recreation shall be counted (the play areas at a school or college, for example, not the entire school site). Double counting shall be avoided. For example, do not include indoor facilities on parkland.

The area of the entire outdoor recreation site shall be included (including, for example wooded areas of parks, building maintenance and utility areas) but shall exclude parking areas.

NOTE — Many villages may report Panchayat-owned recreation space and this does not include the contribution to recreation from non-Panchayat owned facilities. While the methodology in this Standard is more complex, the result will ultimately be more meaningful. It is recommended that a recreation space inventory be created.

13.2.3 Data Source

This information should be obtained from a district planning department together with departments knowledgeable about the village.

Outdoor recreation spaces may also be delineated using aerial photography and/or land use maps. Reference to the SVAMITVA Scheme in **11.1.3** may also be seen.

Once the areas have been identified on a map, the area in square metres may be calculated using low cost Geographic Information Systems (GIS) or, if not available, through use of hand-held measuring devices. Area may be calculated, in hectares or acres, and converted to square metres.

13.3 Number of Art Galleries, Museums, Cultural Centres per 1 000 Population (Supporting Indicator)

13.3.1 General

Villages require to maintain and showcase their cultural and social heritage by way of art galleries, museums, cultural centres and similar institutions.

13.3.2 Supporting Indicator Requirements

The number of art galleries, museums, cultural centres and similar institutions per thousand of population shall be calculated as the number of such institutions in government, panchayat and other sectors, but available to public at large (numerator) divided by one 1 000th of the village's total population (denominator). The result shall be expressed as the number of art galleries, museums and cultural centres per 1 000 population.

13.3.3 Data Source

This information should be obtained from the Register of Buildings maintained by the Panchayat together with the licensing department. Relevant departments and organizations of the state government can also provide additional information. Non-government sources could also be enumerated for this purpose.

14 SAFETY

14.1 Number of Police Personnel per 1 000 Population (Core Indicator)

14.1.1 General

The number of sworn police personnel per 1 000 population is an indicator of the overall crime prevention in place in a village.

14.1.2 Core Indicator Requirements

The number of police personnel per 1 000 population shall be calculated as the number of permanent fulltime (or full-time equivalent) sworn police personnel (numerator) divided by one 1 000th of the village's total population (denominator). The result shall be expressed as the number of police personnel per 1 000 population.

Sworn law enforcement police personnel should meet the following criteria: work in an official capacity; have full arrest powers; carry identification; and be paid from governmental funds set aside specifically for payment of sworn law enforcement representatives.

Each year, law enforcement agencies shall report the total number of sworn law enforcement officers as of a locally determined date. Personnel counts shall be based on permanent, full-time employees.

14.1.3 Data Source

Data for this indicator is available with the State Police Department.

14.2 Number of Homicides per 1 000 Population (Core Indicator)

14.2.1 General

The number of homicides is an indicator of the amount of crime and an indicator of feelings of personal safety and can affect investors to invest.

14.2.2 Core Indicator Requirements

The number of homicide per 1 000 population shall be calculated as the number of reported homicides (numerator) divided by 1 000th of the village's total population (denominator). The result shall be expressed as the number of homicides per 1 000 population.

Homicide shall include intentional and non-intentional homicide. Intentional homicide shall refer to death deliberately inflicted on a person by another person, including infanticide. Non-intentional homicide shall refer to death non-deliberately inflicted on a person by another person. This shall include manslaughter, but shall exclude traffic accidents that result in the death of a person, and suicides.

14.2.3 Data Source

Data on crime is compiled by State Crime Record Bureaus and consolidated in the form of a Compendium at national level by the National Crime Record Bureau (NCRB), annually. In respect of every village, police station level data can be obtained from the respective State Crime Record Bureau, which can be aggregated to obtain data for the whole or part of a village. These databases include details in respect different social segments, such as crime against women, scheduled castes/tribes, children, etc.

NOTE — Homicides are not always reported as such. In particular, domestic homicides are sometimes reported as suicides or accidents.

14.3 Crimes Against Women Per 1 000 Population (Core Indicator)

14.3.1 General

The number of crimes against women in a village is considered a benchmark for the overall level of safety in the village.

14.3.2 Core Indicator Requirements

The number of crimes against women shall be calculated as the total number of all such crimes reported (numerator) divided by one 1 000th of the village's total population (denominator). The result shall be expressed as the number of crimes against women per1000 population.

Crimes against women include crime head, namely rape; assault on women with intent to outrage her modesty; insult to the modesty of women; importation of girls from foreign country; cruelty by husband or his relatives; kidnapping and abduction of women; abetment of suicides of women; dowry deaths under the Dowry Prohibition Act, 1961; and crime under the Indecent Representation of Women (Prohibition) Act, 1986, the Commission of Sati Prevention Act, 1987, the Protection of Women from Domestic Violence Act, 2005 and the Immoral Traffic (Prevention) Act, 1956.

14.3.3 Data Source

Data on crime is compiled by State Crime Record Bureaus. In respect of every village, police station level data can be obtained from the respective State Crime Record Bureau, which can be aggregated to obtain data for the whole or part of a village. These databases include details in respect different social segments, such as crime against women, scheduled castes/tribes, children, etc.

14.4 Response Time for Police Department from Initial Call (Supporting Indicator)

14.4.1 General

The average response time (in minutes and seconds) it takes a police department to respond to an initial distress call is an indicator of how protected a village's residents are from security and safety threats. Because it has the appearance of objectivity, police response time is a valuable and key operational measure used to assess system performance from the citizen's perspective.

14.4.2 Supporting Indicator Requirements

The response time for police department from initial call shall be calculated as the sum of number of all initial distress calls to the on-site arrival of the police department personnel for the year in minutes and seconds (numerator) divided by the number of police department responses in the same year (denominator). The result shall be expressed as the response time for police department from initial call in minutes and seconds.

The total number of minutes and seconds taken to respond to all emergency calls shall include the time elapsed from receiving the initial call for assistance to arrival on-site of police department personnel is calculated for the preceding 12 months.

15 SEWERAGE AND SANITATION

15.1 Percentage of Village Population Having Access to Sanitary Toilet Facilities (Core Indicator)

15.1.1 General

The percentage of the village population having access to sanitary toilet facilities is an indicator of the health, cleanliness and quality of life available to the citizens.

15.1.2 Core Indicator Requirements

Percentage of village population having access to sanitary toilet facility shall be calculated as the number of people within the village that are provided with water flush sanitary toilets with on site disposal (twin pit pour flush sanitary toilet), septic tank with sanitary disposal of its effluents and individual as well as community toilets connected with wastewater collection network (numerator) divided by village population (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

The number of households having access to sanitary toilet facility be first collected and the number is then multiplied by the current average number of people in household size of the village to determine the number of persons having access to sanitary toilet facility.

In case of people provided with community toilet facility the number of people will be worked out on the basis of 10 persons per latrine seats provided at the community facility. Community toilet facilities provided at commercial places, bus stands, etc, shall not be counted.

15.1.3 Data Source

Information on the number of households having access to sanitary toilet facility in the village should be obtained from the local government and authorized local operator(s) of wastewater systems.

15.2 Percentage of Village Population Served by Sewage (Wastewater) Collection (Core Indicator)

15.2.1 General

The percentage of the village population served by a wastewater collection is an indicator of village health, cleanliness and quality of life. Wastewater collection and treatment is a significant component of the Sustainable Development Goals, Goal 6: Ensure Availability and Sustainable Management of Water and Sanitation for All.

15.2.2 Core Indicator Requirements

Percentage of village population served by wastewater collection shall be calculated as the number of people within the village that are served by wastewater collection (numerator) divided by the village population (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

The number of households in the village serviced with regular wastewater collection shall first be determined by counting the number of households that are connected as part of a public or community owned system of discharge of wastewater through a pipe or similar duct that is connected to a network that takes it to a facility where it is treated. The number of households being serviced by wastewater connection shall then be multiplied by the then current average household size for that village to determine the number of persons serviced with wastewater collection.

NOTE — Results will only indicate whether or not a house has access to wastewater systems, not the quality of the system, the capacity and quality of the service, the levels of loss (contamination), or the capacity of the treatment plants to meet the growth in wastewater volumes. Some of these limitations could be addressed in other supporting indicators.

15.2.3 Data Source

Information on the number of households in the village serviced with regular wastewater collection should be obtained from the local body and the authorized operator(s) of wastewater systems.

15.3 Percentage of the Village's Wastewater that has received no Treatment (Core Indicator)

15.3.1 General

It has been proven that improvement of water treatment reduces the incidence of a variety of water-borne diseases. A reliable wastewater treatment system is a major indicator of the level of local development and of community health. Water pollution from human waste is less of a problem in villages that can afford to treat sewage and wastewater, and water pollution can be minimized with adequate investment in treatment systems. The percentage of wastewater treated is a key indicator of water quality management.

15.3.2 Core Indicator Requirements

Percentage of the village's wastewater that has received no treatment shall be calculated as the total amount of the village's wastewater that has undergone no treatment (numerator) divided by the total amount of wastewater collected in the village (denominator). This result shall then be multiplied by 100 and expressed as a percentage.

No treatment shall refer to collected wastewater that is disposed without any treatment, including periods when wastewater volume exceeds treatment plant capacity.

15.3.3 Data Source

This information may be obtained by village authorities and the wastewater collection and treatment companies, such as the sewage boards or corporations or private operators, if any.

15.4 Percentage of the Village's Wastewater Receiving Primary Treatment (Core Indicator)

15.4.1 General

The percentage of wastewater treated is a key indicator of water quality management. It has been proven that improvement of water treatment reduces the incidence of a variety of water-borne diseases. A reliable wastewater treatment system is a major indicator of the level of local development and of community health. Water pollution from human waste is less of a problem in villages and cities that can afford to treat sewage and wastewater, and water pollution can be minimized with adequate investment in treatment systems.

15.4.2 Core Indicator Requirements

The percentage of the village's wastewater receiving primary treatment shall be calculated as the total amount of the village's wastewater that has undergone primary treatment (numerator) divided by the total amount of wastewater collected in the village (denominator). This result is then multiplied by 100 and expressed as a percentage of the village's wastewater receiving primary treatment.

Primary wastewater treatment shall refer to the physical separation of suspended solids from the wastewater flow using primary clarifiers. This separation reduces total suspended solids as well as the biological oxygen demand (BOD) levels and prepares the waste stream for the next step in the wastewater treatment process.

NOTE — Biological Oxygen Demand (BOD) is the amount of dissolved oxygen required to oxidize or neutralize biodegradable matter in water. High BOD levels represent high amounts of contaminant matter, and the reduction of BOD is a common measure for determining the efficacy of water treatment.

Some villages have no system for treating wastewater. This shall be reported.

15.4.3 Data Source

This information may be obtained from village authorities and the authorized water supply and treatment companies.

15.5 Percentage of the Village's Wastewater Receiving Secondary Treatment (Supporting Indicator)

15.5.1 General

It has been proven that improvement of water treatment reduces the incidence of a variety of water-borne diseases. A reliable wastewater treatment system is a major indicator of the level of local development and of community health. Water pollution from human waste is less of a problem in villages that can afford to treat sewage and wastewater, and water pollution can be minimized with adequate investment in treatment systems. The percentage of wastewater treated is a key indicator of water quality management.

15.5.2 Core Indicator Requirements

Percentage of the village's wastewater receiving secondary treatment shall be calculated as the total amount of the village's wastewater that has undergone secondary treatment (numerator) divided by the total amount of wastewater collected in the village (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

Secondary treatment shall refer to the process of removing or reducing contaminants or growths that are left in the wastewater from the primary treatment process. Secondary treatment reduces Biological Oxygen Demand (BOD) by microbial oxidation.

Some villages have no system for treating wastewater. This shall be reported.

15.5.3 Data Source

This information may be obtained from village authorities and the authorized water supply and treatment companies.

15.6 Percentage of the Village's Wastewater that is being Recycled and Reused (Supporting Indicator)

15.6.1 General

Of the total fresh water supplied to a village, almost 80 percent get converted in to wastewater after use and can be reclaimed after suitable recycling. In the process of recycling, sludge also gets generated.

Reclaimed water can significantly augment freshwater sources and mitigate water stress for villages. Reclaimed water can be an ideal choice for industrial use, construction activities and agriculture and horticulture including for avenue plantations.

Sludge can be used in agriculture and for generation of energy. However, sludge from certain sources could contain toxins, which need to be isolated. Decentralized wastewater treatment could help in identification and isolation of such sources.

15.6.2 Core Indicator Requirements

Percentage of the village's wastewater being recycled and reused shall be calculated as the total amount of the village's recycled wastewater that is being pushed into supply lines or being supplied to bulk users through tankers (numerator), divided by the total amount of wastewater that is received by the treatment plants of the village (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

15.6.3 Data Source

This information may be obtained from village authorities and authorized wastewater supply and treatment companies/agencies.

15.7 Percentage of the households having connectivity to closed drainage for waste water outlet (Supporting Indicator)

15.7.1 General

Closed drains can be used for carrying greywater to the treatment facility. As per the Swachh Bharat Mission (Grameen) Phase-II guidelines, the existing open drains within villages can be covered and used for this purpose. Covered drains for greywater should be adopted in the areas where the treatment at household and cluster level is not possible, either due to space constraints or a permanently high water table. The drains should lead the greywater to the treatment facility.

15.6.2 Core Indicator Requirements

The flow of greywater from household to treatment plant through closed drains includes household connections, drains with removable covers at regular intervals, interceptng chamber at the tail end of the treatment unit, and the treatment unit itself.

Percentage of the households having connectivity to closed drainage for waste water outlet shall be calculated as the total number of the village's households having such connectivity (numerator), divided by the total households in the village (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

15.6.3 Data Source

The absolute number and the percentage of households having connectivity to closed drainage for waste water outlet, in the country as a whole and in various states; for total, urban and rural areas separately, as per the Census Department.

In some cases, surveys can also be conducted.

16 SOLID WASTE

16.1 Percentage of Village Population Covered with Regular Solid Waste Collection (Residential) (Core Indicator)

16.1.1 General

The percentage of the village population served by regular solid waste collection is an indicator of village health, cleanliness and quality of life. Solid waste systems contribute in many ways to public health, the local economy, the environment, and the social understanding and education about the environment.

16.1.2 Core Indicator Requirements

The percentage of village population with regular solid waste collection shall be calculated as the number of people within the village that are served by solid waste collection (numerator) divided by the total village population (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

The number of households in the village serviced with regular solid waste collection shall first be determined. The number of households being serviced by the regular solid waste collection service shall then be multiplied by the current average household size for that village to determine the number of persons serviced with regular solid waste collection. Regular solid waste collection shall be defined as having the solid waste picked up from the household, transported and dumped at a proper treatment facility (recycling or landfill sites) on at least a weekly basis or every two weeks. If the solid waste is collected in any moving vehicle by persons who have not constituted a legally established entity, the house shall not be considered as a household serviced with a solid waste collection service.

NOTE — Use of persons rather than village area as the metric for this indicator avoids the distortion arising from local government areas that include both urban and rural areas.

16.1.3 Data Source

Information should be obtained from the local operator(s) of solid waste collection systems, census data, and waste processing facilities as submitted in the annual form-II of *Solid Waste Management Rules*, 2016, read along with similar rules, such as the Bio-Medical Waste Management Rules, 2016, *Construction and Demolition Waste Management Rules*, 2016, *E-Waste Management Rules*, 2016, *Hazardous and Other Waste (Management and Trans-Boundary Movement) Rules*, 2016, *Batteries (Management and Handling) Rules*, 2001 and *Plastic Waste Management Rules*, 2016.

16.2 Total Collected Municipal Solid Waste per Capita per Year (Core Indicator)

16.2.1 General

This indicator provides a measure of how much waste a village is producing and the level of service a village is providing for its collection. Higher levels of solid waste contribute to greater environmental problems and therefore levels of collection, and also methods of disposal, of the solid waste are an important component of the villages' environmental management. Collection of the solid waste is also an indicator of village management with regard to cleanliness, health and quality of life. Solid waste systems contribute in many ways to public health, the local economy, the environment, and the social understanding and education about the environment.

16.2.2 Core Indicator Requirements

This indicator shall be calculated as the total amount of solid waste (household and commercial) generated in tonnes (numerator) divided by the total village population (denominator). The total collected municipal solid waste per capita shall be expressed as the total municipal solid waste produced in the village per person per year.

The data shall only refer to the waste flows managed under the responsibility of the local administration including waste collected on behalf of the local authority by private companies or regional associations founded for that purpose.

Village waste should include waste originating from-

- a) households; and
- b) commerce and trade, small businesses, office buildings and institutions (for example, schools, hospitals, temples and government buildings).

The definition should also include,

1) bulky waste (for example, white goods, old furniture and mattresses);

2) garden waste, leaves, grass clippings, street sweepings, the content of litter containers, and market cleansing waste, if managed as waste; and

3) waste from selected civic services, that is waste from park and garden maintenance, waste from street cleaning services (for example, street sweepings, the content of litter containers, market cleansing waste), if managed as waste. The definition shall exclude:

- i) waste from village sewage network and treatment; and
- ii) construction and demolition waste.

16.2.3 Data Source

Information should be obtained from the local operator(s) of solid waste collection systems, census data, and waste processing facilities as submitted in the annual form-II of the *Solid Waste Management Rules*, 2016.

16.2.4 Data Interpretation

The proper discharge, transportation and treatment of solid waste is one of the most important components of life in a village and one of the first areas in which governments and institutions should focus. Solid waste systems contribute in many ways to public health, the local economy, the environment, and the social understanding and education about the environment. A proper solid waste system can foster recycling practices that maximize the life cycle of landfills and create recycling micro-economies, and it provides alternative sources of energy that help reduce the consumption of electricity and/or petroleum based fuels.

16.3 Percentage of the Villages' Solid Waste that is Recycled (Core Indicator)

16.3.1 General

Recycling the waste, after suitable segregation, not only helps in controlling the waste generation quantity but also manages the effective utilization of waste. In addition, it puts the waste to productive economic use.

Recycled materials shall include household waste, garden waste, construction and demolition waste, e-waste, hospital waste, industrial waste, etc. It shall also include those materials diverted from the waste stream, recovered, and processed into new products.

16.3.2 Core Indicator Requirements

The percentage of the village's solid waste that is recycled shall be calculated as the total amount of the village's solid waste that is recycled in tonnes (numerator) divided by the total amount of solid waste produced in the village in tonnes (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

Recycled materials shall denote those materials diverted from the waste stream, recovered, and processed into new products.

Hazardous waste that is produced in the village and is recycled shall be reported separately.

16.3.3 Data Source

Information should be obtained from the local operator(s) of solid waste collection systems, census data, and waste processing facilities as submitted in the annual form-II of the *Solid Waste Management Rules*, 2016.

16.4 Percentage of the Village's Solid Waste that is Disposed of in a Sanitary Landfill (Supporting Indicator)

16.4.1 General

Many villages generate more solid waste than they can dispose of. Even when village panchayat budgets are adequate for collection, the safe disposal of collected waste

often remains a problem. Open dumping and unsanitary landfills are sometimes the main disposal methods, particularly in lower income villages. Sanitary landfills are the norm in only a limited number of villages and cities worldwide.

Open dumping and landfills are sometimes the main disposal methods chosen resulting in so many nuisances. Biodegradable waste and other useful wastes taken to landfill not only unnecessarily occupy the precious land in the village, but can also contribute to ground water contamination, methane production, odour nuisance, etc., if left unchecked. Hence, it is desirable that only limited and non-decomposable waste goes to landfills. However, all efforts should be made to make economic use of all waste by recycling, leading to a 'zero landfill' situation.

16.4.2 Supporting Indicator Requirements

The percentage of the village's solid waste, that is disposed of in a sanitary landfill shall be calculated as the amount of the village's solid waste that is disposed of in a sanitary landfill in tonnes (numerator) divided by the total amount of solid waste produced in the village in tonnes (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

Sanitary landfill shall refer to a carefully designed structure, which uses a clay liner or a synthetic liner in order to isolate solid waste from the surrounding environment. This isolation is accomplished with a bottom liner and daily covering of soil.

16.4.3 *Data Source* (See **16.1.3**)

16.5 Percentage of the Village's Solid Waste that is Disposed of in an Incinerator (Supporting Indicator)

16.5.1 General

Many villages generate more solid waste than they can dispose of. Even when village panchayat budgets are adequate for collection, the safe disposal of collected waste often remains a problem. As sanitary landfill sites are limited, villages examine other alternatives for disposal, such as incineration.

Incinerators provide the quick way of processing the waste giving energy as a byproduct. The volume reduction is assumed to be the 90 percent of the original volume and the energy output can be refined by improving the quality of the processing waste in the initial phases.

16.5.2 Supporting Indicator Requirements

The percentage of the village's solid waste that is disposed of in an incinerator shall be calculated as the total amount of the village's solid waste that is disposed of in an incinerator in tonnes (numerator) divided by the total amount of solid waste produced in the village in tonnes (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

16.5.3 Data Source

This information should be obtained from the panchayat bodies, public services and major private contractors dealing with solid waste processing and disposal. Data may be obtained from specific studies carried out on solid waste for specific projects and the state pollution control bodies/committee.

16.6 Percentage of the Village's Solid Waste that is Burned Openly (Supporting Indicator)

16.6.1 General

Many villages generate more solid waste than they can dispose of. Even when the village panchayat budgets are adequate for collection, the safe disposal of collected waste often remains a problem. Open burning as a disposal method remains an alternative for some villages facing budgetary limitations, particularly in lower income villages.

16.6.2 Supporting Indicator Requirements

The percentage of the village's solid waste that is burned openly shall be calculated as the amount of the village's solid waste that is burned in tonnes (numerator) divided by the total amount of solid waste produced in the village in tonnes (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

NOTE-_Burned openly shall refer to the combustion of solid waste in an open dump or open space.

16.6.3 Data Source

This information should be obtained from the panchayat bodies, public services and major private contractors dealing with solid waste collection and disposal. Data may be obtained from specific studies carried out on solid waste for specific projects.

Information on selected disposal methods should be gathered from municipal facilities and operators, parastatal and private companies dealing with solid waste treatment. Solid waste experts, as well as NGOs working in this area, may be consulted.

When data are not available, an estimate of the proportion of waste to sanitary landfill and the proportion disposed to open dump should be provided.

16.7 Percentage of the Village's Solid Waste that is Disposed of in an Open Dump (Supporting Indicator)

16.7.1 General

Many villages generate more solid waste than they can dispose of. Even when the village panchayat budgets are adequate for collection, the safe disposal of collected waste often remains a problem. Open dump as a disposal method remains an alternative for some villages facing budgetary limitations, particularly in lower income villages.

16.7.2 Supporting Indicator Requirements

The percentage of the village's solid waste that is disposed of in an open dump shall be calculated as the amount of the village's solid waste that is disposed of in an open dump in tonnes (numerator) divided by the total amount of solid waste produced in the village in tonnes (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

Open dump shall refer to an uncovered space or hole where solid waste is disposed of without further treatment.

16.7.3 *Data* Source (See **16.6.3**)

16.8 Percentage of the Village's Solid Waste that is Disposed of by Other Means (Supporting Indicator)

16.8.1 General

Many villages generate more solid waste than they can dispose of. Even when the village panchayat budgets are adequate for collection, the safe disposal of collected waste often remains a problem.

Other means shall refer to methods of disposal by means other than the ones indicated in **16.3** (recycling), **16.4** (sanitary landfill), **16.5** (incinerator), **16.6** (burned openly), and **16.7** (open dump).

16.8.2 Supporting Indicator Requirements

The percentage of the village's solid waste that is disposed of by other means shall be calculated as the total amount of the village's solid waste that is disposed of by other means in tonnes (numerator) divided by the total amount of solid waste produced in the village in tonnes (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

16.8.3 *Data Source* (see **16.6.3**)

16.9 Percentage of the Villages's Agricultural Waste that is Recycled (Core Indicator)

16.9.1 General

Recycling the agricultural waste, after suitable segregation, not only helps in controlling the waste generation quantity but also manages the effective utilization of waste, besides avoiding the hazardous disposal methods such as the incineration or burning, or dumping in open spaces or in the water bodies. In addition, recycling puts the waste to productive economic use for which many options have already become available and more are coming up following the research and development activities.

The waste generated from agricultural practices can be converted into products that are useful for humans, animals or for farm lands. Some examples are: Green Construction Materials from paddy straw stubble, Fortified Rice Analogues from Broken Rice and Dal, Protein Isolates/Concentrates from De-Oiled Cakes/Meals, Microbial Protein using Corn Cob, Kulhad from Corn Cob Powder, Biochar from Agricultural Waste Material, Soil-less Planting Media Using Sugar Industry Residue, Enzymes Cellulases at Industrial Scale by Microbial Fermentation Utilizing Groundnut Shell as Substrate etc.

16.9.2 Core Indicator Requirements

The percentage of the villages's agricultural waste that is recycled shall be calculated as the total amount of the village's agricultural waste that is recycled in tonnes (numerator) divided by the total amount of agricultural waste produced in the village in tonnes (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

Agricultural waste shall include straw stubble, husk, leaves and stems, de-oiled cakes, sugarcane bagasse, groundnut shells, etc. Waste generated during agro-processing activities shall also be included.

16.9.3 Data Source

Information on the waste generated from agricultural practices should be obtained from the local operator(s) of solid waste collection systems, census data, and waste processing facilities as submitted in the annual form-II of the *Solid Waste Management*

(SWM) Rules, 2016. Village Panchayats are also required to prepare *waste* management plans vide Rule 15 of the SWM Rules, which would make it necessary for them to collect such information.

16.10 Disposal of animal carcass (Supporting Indicator)

Large number of animals including milch cattle and draft animals, besides pets, die every year in all villages. However, there often is no organised and scientific system of disposal of the carcasses, making it a serious environmental hazard. Improper disposal of carcasses can result in public outrage, site contamination, ground water contamination, environment contamination, public health issues, and the disease spread through scavengers, mosquitoes and vermin.

The overall goal of any animal carcass disposal and management plan should be to ensure clean and safe disposal of all materials in a manner that protects human, animal, and environmental health

It is also mandatory under the *Prevention and Control of Infectious and Contagious Diseases in Animal Act* 2009 and the Rules made thereunder, to dispose of the fallen animals/carcasses properly by way of either burial, or incineration, or rendering under the supervision of a veterinarian.

16.10.2 Core Indicator Requirements

The Department of Animal Husbandry & Dairying of The Government of India has issued detailed Guidelines on Disposal of Animal Carcass and Disinfection. Broadly stated, these Guidelines proscribe the requirement of land for burial purposes. For instance, it recommends the land requirement of 1.5 cubic meters for adult cattle carcass, 0.3 cubic meter for pig/sheep carcass and 1.0 cubic meter for 200 chickens. It also provides similar norms for safe burning of the carcasses. All villages need to have suitable area earmarked for safe disposal of the carcasses as per these Guidelines.

16.10.3 Data Source

Information on the availability of spaces earmarked for the safe burial/cremation of animals and birds, should be available with the Panchayat Secretary of the area and in the Land Records available with the Local Land revenue Office.

17 TELECOMMUNICATION AND INNOVATION

17.1 Number of Internet Connections per 1 000 Population (Core Indicator)

17.1.1 General

The number of internet connections is an indicator of information access and communication technology connectivity. Internet connections are available through wireless media as well as through fixed/wired media.

17.1.2 Core Indicator Requirements

The number of internet connections per 1 000 population shall be calculated as the number of internet connections in the village (numerator) divided by one 100 000th of the village's total population (denominator). The result shall be expressed as the number of internet connections per 1 000 population.

Internet connections shall refer to the number of internet subscriptions and not the number of people with internet access.

17.1.3 Data Source

Internet service and telecommunications providers in the form of subscriber locations and accounts keep Internet access records.

Census 2011 too gives information on households having computers with internet access.

Department of Telecommunications (DOT) compiles data on the availability of personal computers, number of internet users, telephone lines, mobile phones and televisions sets in the country and publishes it on their website for the country as a whole. DOT also publishes data on total number of telephone connections, in the categories of wireline, wireless, public, private, urban and rural and updates the same on a monthly basis on its web portal. DOT can possibly make arrangements to publish village level data as well.

17.2 Percentage of Households with Computer/Smart Phone (Core Indicator)

17.2.1 General

Computer refers to a desktop computer, laptop (portable) computer, tablet or similar handheld computer. It does not include equipment with some embedded computing abilities, such as smart TV sets, or devices with telephony as a main function, such as mobile phones or smartphones.

A 'smart phone' is different from a normal mobile phone owing to the feature of internet browsing and the related features. However, it serves many of the purposes of a computer, besides being more handy and portable vis-à-vis a computer.

Household with a computer means that the computer is available for use by all members of the household at any time. The computer may or may not be owned by the household, but should be considered a household asset.

Computers and smart phones today are essential tools for empowering the citizens with knowledge and education. They contribute in enhancing the literacy level of any village or city. Further, for empowering the citizens with the various citizen services enabled by the internet, computers and smart phones have turned out to be powerful enablers for ubiquitous internet experience.

Availability of computers and smart phones will ensure all services associated with village like information sharing, e-healthcare, banking transactions, and public governance facilities are available to inhabitants as per their necessity and without any inconvenience.

Nowadays, smart phones also offer the access to internet browsing and the related features and hence, owing a smart phone is virtually as useful as owing a computer, in many ways.

NOTE— A 'smart phone' is different from a normal mobile phone owing to the feature of internet browsing and the related features.

17.2.2 Core Indicator Requirements

The percentage of households with computer shall be calculated as number of households using computers divided by total number of households in the village. The result shall be expressed as the percentage by multiplying by 100. Similar exercise should be made in respect of smart phones too.

17.2.3 Data Source

Data on this indicator is available in the decennial census of population and amenities (for example, Table HH-12 of House-listing operations in Census 2011).

In addition, Department of Telecommunications (DOT) may also be approached to provide the village level data for this indicator, as noted in **17.1.3**.

The National Family Health Survey (NFHS) also collects information on the number of households having (a) internet connectivity, (b) computers, (c) mobile phones, and (d) landline phones. However, NFHS is conducted quinquennially and on sample survey basis, making available the data for districts, states and the country but not for the villages. However, another feature of NFHS is that it gives data for males and females, urban and rural separately, along with age-groups.

NOTE— None of these surveys distinguish between 'smart phone' and normal mobile phone.

17.3 Percentage of Households with Internet Access (Supporting Indicator)

17.3.1 General

The Internet is a worldwide public computer network. It provides access to a number of communication services, including the World Wide Web (WWW), and carries e-mail, news, entertainment and data files, irrespective of the device used (not assumed to be only a computer. It may also be a mobile telephone, tablet, PDA, games machine, digital TV, and so on). Access can be *via* a fixed or mobile network. Household with internet access means that the internet is available for use by all members of the household at any time.

Availability of Internet across multiple platforms will ensure all services associated with the village like information sharing, e-healthcare, banking transactions, and public governance facilities are available to inhabitants as per their necessity and without any inconvenience.

17.3.2 Supporting Indicator Requirements

Data for the same may be calculated as number of households using Internet (numerator) divided by total number of households in the village (denominator).

The result shall be expressed as the percentage by multiplying by 100.

17.3.3 Data Source

Data on this indicator is available in Census 2011 (Table HH-12 of House-listing operations).

Department of Telecommunications (DOT) may also be approached to provide the village level data for this indicator, as noted in **17.1.3**.

17.4 Cyber Security Readiness for ICT Infrastructure and Online Citizen Service Delivery (Core Indicator)

17.4.1 General

Cyber security focuses on protecting computers, networks, programmes and data from unintended or unauthorized access, change or destruction.

Creation of large centralized databases that contains confidential information pertaining to users, accessible over the Internet in real time poses a threat to operational and security concerns like interception and tampering of data sent over the networks. To overcome this information technology (IT) infrastructure will have to be highly secure and resilient with proper backup systems to ensure round the clock availability.

Security and privacy issues will have to be countered at various stages of information lifecycle that is data collection, storage and transmission, by ensuring that standard operating procedures are followed during data collection, adequate IT infrastructure is available to handle large amount of data and proper security measures are adopted to protect the data.

Also, the authority, responsibility and accountability of the village administration will have to be well defined in case of any event of unauthorized access or leakage. To ensure the continued security of the information and communication technology (ICT) infrastructure, security audits shall need to be conducted at regular intervals and security definitions and patches updated.

17.4.2 Core Indicator Requirement

Cyber security readiness of the ICT infrastructure in a village shall be calculated as number of ICT enabled services that are secure and resilient (numerator) divided by total number of ICT enabled services in the village (denominator). The result shall be multiplied by 100 and expressed as a percentage.

17.4.3 Data Source

Data on cyber crime is compiled by the District and State Crime Record Bureaus and consolidated in the form of a compendium at national level by the National Crime Record Bureau (NCRB), annually. The foundation level data is at Police station level data, from which village-level data can be obtained with authorisation from the respective State Crime Record Bureau.

Data regarding the same may also possibly be captured from various citizen centric service providers, Internet Service Providers (ISPs), National Informatics Centre (NIC) and, more significantly, by the National Critical Information Infrastructure Protection Centre (NCIIP), which is the watchdog agency for ensuring the security of the ICT Infrastructure in the country.

17.5 Number of New Patents per 1 000 Population per Year (Supporting Indicator)

17.5.1 General

The number of patents issued to resident persons or corporations of a village is an indicator of commercial and technological innovation.

17.5.2 Supporting Indicator Requirements

The number of new patents per 1 000 population per year shall be calculated as the total number of new patents issued to resident persons and enterprises of the village (numerator) divided by one 1 000th of the village's total population (denominator). The result shall be expressed as the number of patents registered per 1 000 population.

17.5.3 Data Source

As patents are generally issued by the national government, villages will be reliant on another level of government to provide this information on an annual village basis. For instance:

- a) Controller General of Patents, Designs and Trademarks, Ministry of Commerce and Industry for national level data.
- b) Geographical Indication registry portal of the Controller General of Patents Designs and Trademarks, Ministry of Commerce and Industry for state level data.
- c) The District Industries Office for village level data on patents

18 TRANSPORTATION

18.1 Ratio of Kilometres of pucca (surfaced, or, asphalted) roads to kacha (unsurfaced) roads (Core Indicator)

18.1.1 General

Rural Roads, though defined as low traffic volume Roads, are a key component of rural development, as they promote access to economic and social services, thereby generating increased agricultural as well as non-agricultural productivity, and employment, which in turn expands rural growth opportunities and real income.

The pucca (that is, surfaced, or, asphalted) roads provide all-weather connectivity to the residents for social and economic/livelihood purposes.

18.1.2 Supporting Indicator Requirements

The ratio of Kilometres of pucca (surfaced, or, asphalted) roads to the kacha (unsurfaced) roads shall be calculated as the total recorded length of the pucca (surfaced, or, asphalted) roads in the village (numerator) divided by the total recorded length of the kacha (unsurfaced) roads of the village (denominator). The result shall be expressed as the percentage by multiplying by 100.

18.1.3 Data Source

Data on the length of roads of all types, including the surfaced and unsurfaced roads, is maintained by the State Public Works Department.

18.2 Kilometres of High Capacity Public Transport System per 1 000 Population (Core Indicator)

18.2.1 General

The extent of a village's transportation network can provide insight into traffic congestion, transportation system flexibility and form. Larger villages shall justify the requirement of high capacity public transport system, such as Bus Rapid Transit System (BRTS). However, high capacity public transport would need to be integrated with non-motorized modes of transportation, including cycling and walking.

18.2.2 Core Indicator Requirements

The kilometres of high capacity public transport system per 1 000 population shall be calculated by adding the kilometres of high capacity public transport systems operating within the village (numerator) divided by one 1 000th of the village's total population (denominator). The result shall be expressed as the kilometres of high capacity public transport system per 1 000 population.

High capacity public transport may include heavy rail metro, sub-way systems and commuter rail systems.

18.2.3 Data Source
Information on kilometres of high capacity public transport should be gathered from block/ district/ regional transport offices and the transit authorities/companies like the metro rail corporations and can also be counted using computerized mapping, aerial photography, or existing paper maps, all of which shall be field-verified. This information may be gathered from transport system plans or other master plans.

18.3 Kilometres of Light Passenger Public Transport System per 1 000 Population (Core Indicator)

18.3.1 General

The extent of a village's transportation network can provide insight into traffic congestion, transportation system flexibility, and urban form. Larger villages shall justify the requirement of high capacity public transport system, such as Bus Rapid Transit System (BRTS). However, high capacity public transport may not be financially viable in some situation, where other options of Light passenger public transport systems, such as the smaller Buses, tramways, pod systems, ferries, etc., may be cost-effective than the heavy ones. Additionally, such public transport would need to be integrated with non-motorized modes of transportation, including cycling and walking.

18.3.2 Core Indicator Requirements

The kilometres of light passenger public transport system per 1 000 population shall be calculated by adding the kilometres of light passenger transport systems provided within the village (numerator), divided by one 1 000th of the village's total population (denominator). The result shall be expressed as the kilometres of light passenger transport system per 1 000 population.

18.3.3 Data Source

Information on kilometres of light passenger transport should be gathered from block/district/regional transport offices and the transit authorities/companies like the BRTS operator, tramways company, etc., and can also be counted using computerized mapping, aerial photography, or existing paper maps, all of which shall be field-verified. This information may be gathered from transport system plans or other master plans.

18.4 Annual Number of Public Transport Trips per Capita (Core Indicator)

18.4.1 General

Transport usage is a key indicator of how easy it is to travel in the village by modes other than single occupancy vehicles. The indicator might also provide insight into transportation policy, traffic congestion, and urban form. Transport usage also addresses overall travel patterns in the village, and helps the citizens, particularly women, explore better job opportunities.

18.4.2 Core Indicator Requirements

Annual number of public transport trips per capita shall be calculated as the total annual number of transport trips originating in the village (ridership of public transport) (numerator), divided by the total village population (denominator). The result shall be expressed as the annual number of public transport trips per capita.

Transport trips shall include trips *via* heavy rail metro or sub-way, commuter rail, BRTS, tramways, organized bus services, and other public transport services.

Villages shall only calculate the number of transport trips with origins in the village itself.

NOTE — Transport systems often serve entire metropolitan areas, and not just central villages. The use of number of transport trips with origins in the village itself will still capture many trips whose destination are outside the village, but will generally capture the impact that the village has on the regional transport network.

18.4.3 Data source

Transport data should be gathered from a number of sources, including: the local/regional transport authorities, transport systems operators, and the revenue collection systems (for example number of fares purchased).

NOTES

1 Fare box records (for example, transport fares paid) are usually the primary source of data for this indicator. However, the relationship between fares purchased and trips taken is not always exact. For example, many transport systems do not actively check for proof of fare purchase often, riders are expected to have valid tickets, and are severely fined if a ticket is not presented, but enforcement of such rules is not uniform for every rider on every trip. Other transport systems offer monthly or weekly passes, which do not necessarily allow for accurate counts of each trip.

2 In many villages and cities, a large number of trips are made *via* 'informal transport' services (for example, mini-buses not operated by the government or municipal transport corporation). These informal trips are not part of the official transport network and shall not be counted.

3 While higher transport ridership rates are generally considered desirable, extremely high ridership rates can also indicate overcrowding problems.

18.5 Percentage Share of Electric Vehicles as Part of Total Vehicles in a Village (Supporting Indicator)

18.5.1 General

Automobile industry is one of the key sectors driving economic growth. More than 25.93 million vehicles including passenger vehicles, commercial vehicles, three wheelers and two wheelers were produced in 2022-23 in India. However, automobiles are also one of the biggest contributors of pollution. Therefore, shifting to electric mobility is one of the important aspects of de-carbonizing transport sector in the country.

18.5.2 Supporting Indicator Requirements

The percentage share of electric vehicles will be calculated as total electric vehicle registered in a year (numerator) per total vehicles registered in that year (denominator) for a village. The result shall be expressed as the percentage by multiplying by 100.

18.5.3 Data Source

The data can be obtained from transport department of the district and Regional Transport Office (RTO).

18.6 Percentage of Road Network with Usable Pedestrian Pathway/Footpath Network (Supporting Indicator)

18.6.1 General

Sustainable habitats, be it the villages or the cities, should have equitable streets with priority to pedestrian infrastructure. The village should have street network to ensure safe and efficient access for all users including pedestrians. A transportation system that is conducive to pedestrian movement can reap many benefits in terms of reduced

road fatalities and improved quality of life. Economic rewards both to the individual and to society are also realized through reduced health care costs and reduced dependency on auto ownership (and resulting in insurance, maintenance and fuel costs). Pedestrian pathway/footpaths also require relatively small infrastructure investments as compared to other types of transportation infrastructure and therefore, less environmental impact. The pedestrian pathway/footpath network system needs to be connected and continuous, just like roadways and railways.

18.6.2 Supporting Indicator Requirements

Percentage of road networks with safe usable pedestrian pathway/ footpath shall be calculated as length of usable footpath (numerator) per total road length (denominator). The result shall be expressed as the percentage by multiplying by 100.

18.6.3 Data Source

The data can be obtained from agencies engaged with planning for and maintenance of roads in the village, such as the State Public Works Department. In some cases, even the Panchayats may also be maintaining such information.

18.7 Percentage of Road Network with Cycling Lanes (Supporting Indicator)

18.7.1 General

A transportation system that is conducive to bicycling can reap many benefits in terms of reduced traffic congestion and improved quality of life. Economic rewards both to the individual and to society are also realized through reduced health care costs and reduced dependency on automobile ownership (and the resulting costs in insurance, maintenance and fuel costs). Bicycle lanes or pathways or tracks also require relatively small infrastructure investments as compared to other types of transportation infrastructure and comparatively less environmental impact.

18.7.2 Supporting Indicator Requirements

Percentage of road networks with cycling lanes or pathways or tracks shall be calculated as length of cycle tracks or pathways or lanes (numerator) per total road length (denominator). The result shall be expressed as the percentage by multiplying by 100.

Cycling lanes shall refer to part of a carriageway designated for cycles and distinguished from the rest of the road/carriageway by longitudinal road markings. Cycling pathways shall refer to independent road or part of a road designated for cycles and sign-posted as such. A cycling/cycle track is separated from other roads or other parts of the same road by structural means.

Bicycle lanes or paths that exist on both sides of the same road shall be counted separately.

18.7.3 Data Source

The data can be obtained from agencies engaged with planning for and maintenance of roads in the village, such as the State Public Works Department. In some cases, even the Panchayats may also be maintaining such information.

18.8 Transportation Fatalities per 1 000 Population (Supporting Indicator)

18.8.1 General

Traffic accident rates and, specifically, fatality rates, can serve as indicators for the overall safety of the transportation system, the complexity and congestion of the roadway and transport network, the amount and effectiveness of traffic law enforcement, the quality of the transportation fleet (public and private), and the condition of the roads themselves. Traffic deaths represent the most severe type of traffic safety failure, allowing villages to focus on their most urgent traffic safety needs.

18.7.2 Supporting Indicator Requirements

Transportation fatalities per 1 000 population shall be calculated as the number of fatalities related to transportation of any kind within the village borders (numerator), divided by one 1 000th of the village's total population (denominator). The result shall be expressed as the number of transportation fatalities per 1 000 population.

The village shall include in this indicator deaths due to any transportation-related proximate causes in any mode of travel (automobile, public transport, walking, bicycling, etc). The village shall count any death directly related to a transportation incident within village limits, even if death does not occur at the site of the incident, but is directly attributable to the accident.

NOTE — Transportation fatalities are used here as a proxy for all transportation injuries. Whereas, many minor injuries are never reported, and thus cannot be measured. Deaths are almost always reported. It is also worth noting that differences in the quality of the roadway, the quality of motorized vehicles, and the nature of law enforcement can change the relationship between injury and fatality.

18.8.3 Data Source

The National Crime Records Bureau compiles state-wise information on accidental deaths and suicides in India (ADSI), including in respect of accidental traffic and road incidents, and publishes the same annually on its website. This data is generated by the police station houses and compiled at district and state levels and compiled at district and state levels by the respective crime bureaux (DCRB and SCRB). Data for a specific village can be secured from the DCRB under authorisation.

In addition, the local transport department office may also be a possible source for such information.

19 VILLAGE DEVELOPMENT PLANNING

19.1 Percentage of Proposed Habitation (Abadi) Development Area with in the Notified Master Plan for the Village (Core Indicator)

19.1.1 General

Master plan notified under appropriate statute is a primary requirement for sustainable development of any village or city. Master plan for a village needs to be integrated with different hierarchy of plans that is zonal plans and local area plans.

Master plan should be based on the relevant statutes and the Rural Area Development Plan Formulation and Implementation (RADPFI) Guidelines, 2021 issued by the Ministry of Panchayati Raj and through a transparent and participatory process. The master plan shall have thematic sub-layers including drainage, sanitation, transit oriented development, disaster and climate resilience, housing, social infrastructure, habitat renewal, etc.

NOTES

1 The master plan and all its sub-layers would have to be detailed on the cadastral map of the village and notified under the relevant statutes.

2 Master plan may have various nomenclatures as per different statutes for example, development plan.

19.1.2 Core Indicator Requirements

Percentage of Proposed Habitation (Abadi) Development Area with in the notified master plan for the village shall be calculated as area of approved area proposed for Habitation (Abadi) development (in square kilometres) (numerator) divided by the total notified master plan area of the village (in square kilometres) (denominator). The result shall be expressed as percentage by multiplying by 100. In the absence of a notified master plan or development, this indicator shall be considered as zero.

19.1.3 Data Source

Data may be obtained from local bodies such as the Panchayat, Development Authority, Planning Authority, Land Revenue Department and other relevant authorities.

19.2 Green Area (hectares) per 1 000 Population (Core Indicator)

19.2.1 General

The amount of green area, natural and semi-natural, parks including biodiversity parks and other open spaces is an indicator of how much green space a village has. Green areas perform important environmental functions in an urban setting. They improve the urban climate, capture atmospheric pollutants, reduce storm runoff and improve quality of life by providing recreation for the village inhabitants.

19.2.2 Core Indicator Requirements

Green area (hectares) per 1 000 population shall be calculated as the total area (in hectares) of green in the village (numerator) divided by one 1 000th of the village's total population (denominator).

This indicator reflects green area that is publicly accessible as opposed to whether or not the green area is protected.

NOTE — Green area is broader than recreation space (see 12).

19.2.3 Data Source

Information on green area should be obtained from Land Revenue Department, Panchayats, development authorities, and horticulture and forestry departments.

It is possible that in some villages may have green area from other owning agencies too, such as military, and these too should be considered.

19.3 Areal Size of Informal Settlements as a Percentage of Village Habitation (Abadi) Area (Supporting Indicator)

19.3.1 General

The size of informal settlements is an indicator of the extent of the challenges for the village in meeting shelter needs and demand. The UN statistics division has developed the following definitions which are used in this standard:

a) Areas where groups of housing units have been constructed on land that the occupants have no formal legal claim to.

b) Unplanned settlements and areas where housing is not in compliance with planning and building regulations (unauthorized housing).

NOTES

1 While many informal settlements also meet the definition of slum, the terms are not synonymous. Slums might exist in areas that do not meet the definition of informal settlements. Some informal settlements might have improved such that they do not meet the definition of slum.

2 Settlements characterized by irregular tenure, unplanned development and unauthorized shelter that is not in compliance with local building regulations are generally marginal and precarious, and affect social well-being, human health and economic development.

19.3.2 Supporting Indicator Requirements

The areal size of informal settlements as a percentage of village habitation (*abadi*) area shall be calculated as the area of informal settlements within the village boundary (in square kilometres) (numerator) divided by the village habitation (*abadi*) area in square kilometres (denominator). The result shall be expressed as the percentage by multiplying by 100.

Areas of informal settlements should be delineated using aerial photography and/or land-use maps and the area in square kilometres shall be calculated. Some low-cost and more sophisticated measurement methodologies have been developed. Once the areas have been identified on a map, the area in square kilometres should be calculated using a low-cost GIS (if available) or measuring devices.

19.3.3 Data Sources

Data should be gathered from the building and property register of the Panchayat, and from Land Revenue Department, together with departments knowledgeable about the village neighbourhoods. Local bodies and academic institutions may also be of assistance.

19.4 Jobs-Housing Ratio (Supporting Indicator)

19.4.1 General

Jobs shall refer to all types of full and part-time employment opportunities including those provided in the retail, industrial, government and office sectors located within the village boundaries. Housing shall refer to all dwelling units available for habitation.

This indicator does not take into account the informal sector, labour or employment, as unofficial employment is unaccounted for.

19.4.2 Supporting Indicator Requirements

The jobs-housing ratio shall be calculated as the total number of jobs (numerator) divided by the total number of dwelling units (denominator). The result shall be expressed as a whole number reflecting jobs to housing ratio within a village.

19.4.3 Data Source

Data on jobs in the organized sector available in the village could be collected from the register of profession tax maintained at the village panchayat office and other levels, District Labour Office, and compiled suitably. In some instances, focussed surveys could also be called for.

Data on housing is available in the town/village Census Directory, which is published decennially and updated with the property data register of the local body concerned.

19.5 Village Flooding (Core Indicator)

19.5.1 General

Rains are necessary for the wellbeing of human beings. Yet, they also make the habitats, in general, prone to flooding, particularly during the rainy season. As most of the rain-spells are short-lived, the flooding too is usually of shorter duration, yet it throws the life and economy of the citizens off the normal track. If and when the rains are of higher intensity, longer duration or more widespread, the impact on the habitats and the citizens is more devastating.

Villages must, therefore, identify their respective vulnerability to floods and, accordingly, undertake measures for both, adaptation and mitigation.

19.5.2 Core Indicator Requirements

The location of the flood prone areas and the highest flood levels, as also the rainfall data, as available in the historical records, particularly of the past 25 years need to identified and noted in the master plans. The master plan, in turn, should restrict the development activities in the flood prone areas. The development control regulations should also be aligned suitably.

The three identified aspects for streamlining sustainability in mitigating urban floods are:

- a) Drainage management (Drng Mgmt);
- b) Rain water harvesting (RWH); and
- c) Rejuvenation and upkeep of village water bodies (WB).

It is advisable that the three listed components be quantified by their performance indices in the respective villages with their weighted values of importance.

 $\frac{Drng Mgmt Index (X)}{= \frac{Length of urban drains cleaned and de - silted before the monsoon}{Total length of surface drains in the village}$

$$RWH Index (Y) = \frac{No. of working RWH structures by annual audit}{Total number of samples audited in the reference year}$$

VWB Index (Z)

 $= \frac{Total area of water bodies conserved and rejuvenated in ref year}{Total area of all listed water bodies within the village limits}$

Where,

X + Y + Z = 1.

The fourth (additional) component, to define the availability of flood relief/shelter areas, could be the Disaster Management Index (DM Index), as follows:

$DM Index = \frac{Flood relief and shelter area identified in the DM Plan (over HFL)}{Area of the village}$

Since, the matter of 'RWH' is subjective for village geomorphology and hence can be selectively judged to be adopted for sustainability. It is proposed that the coefficient of the index so conceived may be kept variable between 0 and 1 while formulating the overall 'Village Flooding' index.

Alongside, villages should prepare suitable action plans for drainage management, rainwater harvesting and proper upkeep of water bodies to offset the impact of flooding. Detailed advisories for the purpose have been issued under various documents such as the NDMA, RDPFI and URDPFI Guidelines, instructions contained in the advisories and policy documents of the state governments concerned, etc.

19.5.3 Data Source

The data relating to parameters for calculation of indices and about the flood prone areas, rainfall data and the highest flood levels, are available in the records of the local government, land revenue department, irrigation and flood control department and district statistical office. Geo-spatial maps available under BHUVAN and other sources can augment the database substantially.

19.6 Basic Services Proximity (Supporting Indicator)

19.6.1 General

The ease with which residents are able to access basic services is an important indicator of overall liveability and quality of life. This indicator measures the percentage of the population that lives within established proximity to basic services.

Basic services include food and everyday products, education centres, health centres, social centres, sports centres, cultural centres, entertainment centres, waste collection points, parks and playgrounds, etc.

19.6.2 Supporting Indicator Requirements

Basic service proximity shall be calculated as the number of inhabitants who live near at least one basic service (numerator) divided by the total population of the village (denominator).

For each type of basic service, the corresponding point layer is created by geo referencing the centres using a relational database join process that relates each centre with its address in the georeferenced municipal street guide.

Once all the layers are included in the GIS, proximity buffers are created for each of them with the help of the GIS buffer geoprocess.

Finally, the population that lives close to the basic service centres are those that are contained in each buffer layer, which can be obtained by a spatial selection.

NOTE— Proximity shall be considered as per the URDPFI guidelines.

19.6.3 Data Source

This information may be obtained from the panchayat authorities and authorized agencies dealing with respective services.

20 WATER SUPPLY

20.1 Percentage of Village Population with Potable Water Supply Service (Core Indicator)

20.1.1 General

The percentage of the village population served by a potable water supply is an indicator of village health and quality of life and a significant component of Sustainable Development Goals, Goal 6: Ensure Availability and Sustainable Management of Water and Sanitation for All.

20.1.2 Core Indicator Requirements

The percentage of village population with potable water supply service shall be calculated as the total number of people with potable water supply service (numerator) divided by total village population (denominator). The result shall then be multiplied by 100 and expressed as a percentage of village population serviced by a potable water supply service.

The total number of people with potable water supply service shall be calculated as the total number of households in the village connected to a potable water supply service multiplied by the current average household size for the village.

NOTE — Results will only indicate whether or not a house has access to potable water, not the quality of the delivery, the levels of loss, consumption or misuse, or the capacity of the sources to meet the demand.

Potable water shall refer to water that is treated or confirmed safe for human consumption. A potable water supply service shall refer to a service that delivers potable water through a pipe or similar duct that is connected to a network. If a house or group of houses has a 'mother' pipe connected either provisionally or permanently; it shall be considered to have access to potable water.

A house shall not be considered to have access to potable water when an individual house or group is served by a conduit system built with for example wood, bamboo, or rubber hose, connected directly to a river, well, or to another house.

20.1.3 Data Source

This information may be obtained from the panchayat authorities and the authorized water supply companies/ agencies.

20.2 Total Domestic Water Consumption per Capita (litres/day) (Core Indicator)

20.2.1 General

Water consumption must be in harmony with water resources, to be sustainable. This harmony may be achieved through improvements in water supply systems and changes in water consumption patterns. This indicator will need to be measured in terms of changes from year to year within a village within a range of rates due to the variability among villages. Consumption of water per person depends on the availability and price of water, the climate, and the uses to which water is customarily put by individuals (for example drinking, bathing, washing and gardening). In many villages, potable water supply is not constant and households rely on a few hours to tap the available water during the day. Water consumption is usually much higher in villages of higher income. A 24×7 water supply is to be aimed at, as this reduces per capita water consumption, besides providing social and economic benefits.

20.2.2 Core Indicator Requirements

The total domestic water consumption per capita shall be calculated as the total amount of the village's water consumption in litres per day for domestic use (numerator) divided by the total village population (denominator). The result shall be expressed as the total domestic water consumption per capita in litres per day. Only water consumed for domestic purpose shall be taken into account. Water consumed for industrial and commercial purposes shall be excluded.

NOTE — A part of the water supplied is lost through leakage or illegal tapping. In villages with old and deteriorating water reticulation systems, a substantial proportion of piped water may be lost through cracks and flaws in pipes. It is therefore important to take this into account in the final consumption measure and if possible, with hundred percent metered connections and the quantity assessed on the basis of meter readings should be considered as quantity consumed.

20.2.3 Data Source

This information should be obtained from the panchayat and the authorized local operator(s) of water supply systems, which maintain records on water supplied, delivered, consumed and ultimately paid by the end-users for domestic purposes.

20.2.4 Data Interpretation

In interpreting this indicator, water consumption per capita should fall within a range that is sustainable for the climate of the village. A minimum benchmark should be established to meet public health and safety needs. Higher rates of per capita water consumption should show reductions approaching the minimum or sustainable consumption rates.

20.3 Total Water Consumption per Capita (litres/day) (Supporting Indicator)

20.3.1 General

Water consumption must be in harmony with water resources to be sustainable. This harmony may be achieved through improvements in water supply systems and changes in water consumption patterns. This indicator will need to be measured in terms of changes from year to year within a village within a range of rates due to the variability among villages. Consumption of water per person depends on the availability and price of water, the climate, and the uses to which water is customarily put by individuals (for example drinking, bathing, washing and gardening) and

industrial, commercial and agricultural entities. In many villages, potable water supply is not constant and households rely on a few hours to tap the available water during the day. Water consumption is much higher in villages of higher income countries, as with most other forms of consumption.

20.3.2 Supporting Indicator Requirements

Total water consumption per capita (litres/day) shall be calculated as the total amount of the village's water consumption in litres per day (numerator) divided by the total village population (denominator). The result shall be expressed as the total water consumption per capita in litres/day.

20.3.3 Data Source

This information should be obtained from the panchayat and the main water supply agencies, which maintain record on water supplied, delivered, consumed and ultimately paid by the end-users.

20.4 Total Water Supply through Metered Water Connections (Supporting Indicator)

20.4.1 General

Water for consumption as domestic, commercial, industrial or any other use, should be provided through water meter connection. Total quantity of water as summation of all meter readings should tally with the quantity of water produced and supplied. Water utility service will keep these records updated.

20.4.2 Supporting Indicator Requirements

Percentage of metered water connection shall be calculated as: $\frac{Number of metered water connections}{Total number of water connections} \times 100$

20.4.3 Data Source

This information should be obtained from the local bodies and authorized water supply agencies, which maintain record on water supplied, delivered, consumed and ultimately paid by the end-users.

20.5 Average Annual Hours of Water Service Interruption per Household (Supporting Indicator)

20.5.1 General

The reliability of water service to the user is the ultimate consideration in evaluating water supply, even though this reliability is based on both quantity and quality considerations and on interconnected systems of source water availability, water treatment and water distribution. This indicator determines whether a water supply

system is reliable, or whether the water supply system needs fundamental or marginal improvements.

20.5.2 Supporting Indicator Requirements

The average annual hours of water service interruption per household shall be calculated by taking the total sum of hours of interruption multiplied by the number of households impacted (numerator), divided by the number of households (denominator). The result shall be expressed as the average annual hours of water service interruption per household. Incidents of complete shutoff, low flow restriction, boil water advisory, water main flushing and planned and unplanned interruptions shall be counted for this purpose.

This indicator shall exclude incidents where there is some reduction to the level of service but where normal activities (shower, washing machine, toilet flushing, etc) are still possible.

An 'unplanned interruption' is an interruption caused by a fault in the utility's system. A 'planned interruption' is an interruption for which the utility has provided at least 24 h advanced notification (or as otherwise prescribed by regulatory requirements).

20.5.3 Data Source

This information should be obtained from the local bodies and authorized water supply agencies, which maintain record on water supplied, delivered, consumed and ultimately paid by the end-users.

20.5.4 Data Interpretation

Villages with older infrastructure, in areas with electric power interruptions, in areas of war or civil unrest, or in areas that are more susceptible to natural hazards such as earthquakes and extensive flooding will tend to report more incidents of service interruptions.

To facilitate comparison among villages, the number of interruptions can also be related to the hectares of water service area within the village.

20.6 Percentage of Water Loss (Unaccounted for Water) (Supporting Indicator) 20.6.1 *General*

Before reaching the users, a part of the water supplied might be lost through leakage or illegal tapping or water supplied for which no revenue is obtained. In villages with old and deteriorating water reticulation systems, a substantial proportion of piped water may be lost through cracks and flaws in pipes, for example, up to 30 percent of water is lost in this way in some villages.

20.6.2 Supporting Indicator Requirements

The percentage of water loss (unaccounted for water) shall be calculated as the volume of water supplied minus the volume of utilized water (numerator) divided by

the total volume of water supplied (denominator). The result shall then be multiplied by 100 and expressed as a percentage.

The water loss includes actual water losses, for example leaking pipes, and billing losses, for example delivered through informal or illegal connection. **20.6.3** *Data Source*

This information should be obtained from local bodies and authorized water supply agencies, which maintain record on water supplied, delivered, consumed.

20.7 Compliance Rate of Drinking Water Quality (Core Indicator)

20.7.1 General

Clean drinking water is a key determinant of human health. The compliance rate of drinking water quality is an indicator which can be used to determine the rate at which drinking water is kept to local regulations and standards to ensure no public health problems.

20.7.2 Core Indicator Requirements

Compliance rate of drinking water quality shall be calculated as the sum of the number of compliant tests multiplied by 100 (numerator) divided by the number of treated water quality tests carried out (denominator).

Compliant tests to be considered are aesthetic, microbiological, physical, chemical and radioactivity tests.

The compliance rate of drinking water quality indicates the percentage of the total number of treated water tests performed that comply with the applicable drinking water local regulations and standards on a quarterly basis to account for seasonal variations. The tests to be taken into account are the analyses performed on the distributed water for each parameter in relation with the local regulation and Indian Standard on drinking water quality.

20.7.3 Data Source

The local body (Panchayat) and the specialized agencies, such as the Jal Boards/Corporations, handling water supply for the village.

20.8 Water supply: Quantity and timeliness to farming activity, livestock rearing and pisciculture (Core Indicator)

20.8.1 General

Water is one of the critical inputs for agricultural production and plays a significant role in food security. As per an assessment of the World Bank, irrigated agriculture represents 20 percent of the total cultivated land and contributes 40 percent of the total food produced worldwide. Irrigated agriculture is, on average, at least twice as productive per unit of land as rainfed agriculture, thereby allowing for more production intensification and crop diversification. DRAFT FOR COMMENTS ONLY

The livestock and pisciculture sectors are also a major user of natural resources such as land and water, currently using about 35 percent of total cropland and about 20 percent of blue water for feed production worldwide. Timelty supply of water to the livestock and pisciculture sectors, along with the agriculture sector, is an essential ingradient for sustainable development and management of not only the livestock and pisciculture sectors, but even of the village economy as a whole.

20.8.2 Core Indicator Requirements

Requirement of water for agriculture is dependent on the nature of crops and the soil. Similarly, for the livestock and pisciculture, the requirement of water shall depend on the types and species of the livestock, and the seasonal conditions. Based on these information, the Local Agriculture Department and the Animal Husbandry Department shall prepare the Water Plan for the quantity of water requirement along with the daily timelines for the water supply. The daily supply shall need to be recorded in a water log book. A comparison of the data for the quantity of water supplied and the timings, with the corresponding information indicated in the Water Plan shall give an idea about the adequacy and timeliness of water supply for these sectors in the village.

NOTE— It would be desirable to install water meters for individual farms, to ensure that all farmers get equal attention.

20.8.3 Data Source

The local body (Panchayat) and the specialized agencies, such as the Jal Boards/Corporations, handling water supply for the village shall prepare the Water Plan and also maintain a record of the water supplies on a daily basis.

ANNEX A

(Foreword)

SUMMARY TABLE OF VILLAGE INDICATORS

A-1 The various indicators, described in this document, are presented in a summary form in the Table 1.

TABLE 1 SUMMARY OF VILLAGE INDICATORS

(Clause A-1)

SI.	Sector	Core Indicator	Supporting Indicator
(1)	(2)	(3)	(4)
i)	Economy (see 4)	Gross domestic product (GDP) for the village GDP Per capita Village's unemployment rate Female entrepreneurship rate (Self Help Group) Percentage of cultivated lands brought under newer methods of agriculture Soil Health	 a) Gini coefficient b) Number of businesses per 100 000 population c) Assessed value of commercial and industrial properties as a percentage of total assessed value of all properties
		Crop yield	
ii)	Education (see 5)	 a) Percentage of female school-aged population enrolled in schools b) Percentage of students completing primary Education: Survival rate c) Percentage of students completing secondary Education: Survival rate d) Primary education student-teacher ratio e) Access to Secondary and Higher Secondary School as per distance criterion f) Access to College 	 a) Percentage of school- aged population enrolled in schools

g) Literacy Rate for adult females Aged 15+

iii)	Energy (<i>see</i> 6)	 a) Percentage of total energy derived from renewable Sources, as a Share of the Village's Total Energy Consumption b) Total electrical energy use per capita (kWh/year) c) Total Electrical Energy Use Per Hectare of Cultivated lands for 	 a) Total residential electrical energy use per capita (kWh/year) b) Average number of electrical interruptions per customer per year c) Average length of electrical interruptions (in hours) d) Percentage of transmission and distribution (T D) losses
iv)	Environment (<i>see</i> 7)	a) Fine Particulate matter (PM _{2.5}) concentration	a) NO ₂ (Nitrogen dioxide) concentration
		b) Particulate matter (PM ₁₀) concentration	b) SO ₂ (Sulphur dioxide) concentration
		 c) Green house gas emissions measured in tonnes per capita d) Air quality index e) Noise pollution f) Quality of public water bodies 	 c) O₃ (Ozone) concentration d) Pest infestation e) Role of Pollinating species in agriculture
v)	Finance (<i>see</i> 8)	a) Debt service ratio (debt service expenditure as a percentage of panchayat's own- source revenue)	 a) Capital spending as a percentage of total expenditure b) Own-source revenue as a percentage of total
			c) Tax collected as a percentage of tax billed
	Governance (see 9	 a)Voter participation in last municipal election (as a percentage of eligible voters) (core Indicator) b)Women as a percentage of total 	 a) Percentage of women employed in the village government workforce b) Number of convictions for corruption by village officials per 100 000 population

		elected to village-level offices	 c) Citizens' representation: number of local official elected to office per 100 000 population d) Number of registered voters as a percentage of the voting age population
vii)	Health (see 10)	 a) Average life expectancy at birth b) Under age five mortality per 1 000 live births c) Number of in-patient hospital beds per 1 000 population d) Number of physicians per 1 000 population e) Number of dentists per 5 000 population f) Animal / bird health (Core Indicator) 	 a) Number of disabled persons per 1 000 population b) Number of nursing and midwifery personnel per 1 000 population c) Suicide rate per 1 000 population d) No. of health sub centres per 10 000 Population e) No. of primary health care centres, dispensaries and/or wellness centres per 1 00 000 Population f) No. of community health care centres per 1 00 000 Population g) Number of veterinary doctors / institutions per 5 000 Population (Supporting Indicator)
viii) ix)	Housing (see 11) Recreation (see 12)	Percentage of village population living in slums	 a) Number of homeless per 1 000 population b) Percentage of households that exist without registered legal titles c) Percentage of slum dwellers having the right to tenure a) Square metres of public indoor recreation space

b) Square metres of public outdoor recreation space per capita c) Number of art galleries, museums, cultural centres per 1 000 population Safety (see 13) a)Number of police Response time for a) police department from personnel per 1 000 initial call population b)Number of homicides Violent crime rate b) per 1 000 population per 1 000 population c) Crimes against women c) Number of per 1 000 population volunteer and part-time d)Number of professional firefighters per 1 000 firefighters per population 1 000 population d) Response time for e)Number of fire related emergency response deaths per Services from initial call 1 000 population e) Response time for f) Number of natural Fire Department from disaster related deaths initial call per 1 000 population f) Number of buildings with fire safety clearance per 1 000 buildings Percentage of the xi) Sewerage and a)Percentage of village a) village's wastewater population having receiving secondary access to sanitary toilet treatment facilities b)Percentage of village Percentage of the b) village's wastewater population served by that is being recycled sewage (wastewater) and reused collection Percentage of the c)Percentage of the c) households having village's wastewater connectivity to closed that has received no drainage for waste treatment water outlet (Supporting d)Percentage of the Indicator) village's wastewater receiving primary treatment a) Percentage of village Percentage of the a) village's solid waste that population covered with regular solid waste is disposed of in a collection sanitary landfill

Sanitation (see 14)

X)

xii) Solid Waste (see 15)

b	 Total collected municipal solid waste per capita per year 	b) Percentage of the village's solid waste that is disposed of in an incinerator
c d	 Percentage of the village's solid waste that is recycled d) Percentage of the Villages's Agricultural Waste that is Recycled 	 c) Percentage of the village's solid waste that is burned openly d) Percentage of the village's solid waste that is disposed off in an open dump e) Percentage of the village's solid waste that is disposed of by other means f) Disposal of animal carcass (Supporting Indicator)
xiii) Tele communication and Innovation (see 16)	 a) Number of internet connections per 1 000 population b) Percentage of households with computer c) Cyber security readiness for ICT infrastructure and online citizen service delivery 	 a) Percentage of households with internet access b) Number of new patents per 1 000 population per year
xiv) Transportation (see 17)	a) Ratio of Kilometres of a pucca (surfaced, or, asphalted) roads to kacha (unsurfaced) roads	 Percentage Share of electric vehicles as part of total vehicles in a village
	b)Kilometres of high capacity public transport system per 1 000 population	 Percentage of road network with usable pedestrian pathway/footpath
	c)Kilometres of light passenger public transport system per 1 000 population	Percentage of road network with cycling lanes
	d)Annual number of public transport trips per capita	per 1 000 population

xv)	Urban Planning (<i>see</i> 18)	 a) Notified master plan for integrated land use b) Green area (hectares) per 100 000 population c) Village flooding 	 a) Areal size of informal settlements as a percentage of villagearea b) Jobs-housing ratio c) Basic services proximity
xvi)	Water Supply (<i>see</i> 19)	 a) Percentage of village population with potable water supply service b) Total domestic water consumption per capita (litres/day) c) Water supply: Quantity and timeliness to farming activity, livestock rearing and pisciculture (Core Indicator) 	 a) Total water consumption per capita (litres/day) b) Total water supply through metered water connections c) Average annual hours of water service interruption per household d) Percentage of water loss (unaccounted for water)
TOTAL	. 16	4 8 - 60	52 61

ANNEX B

VILLAGE PROFILE INDICATORS

B-1 A list of profile indicators, which provide basic statistics and background information about the village, is given in the Table 2. This list contains the core minimum information that should be projected. It can be augmented with additional information that a village would like to showcase.

Table 2 Village Profile Indicators

(Clause **B-1**)

SI No.	Theme	Indicator
(1)	(2)	(3)
iii)	Economy	^{a)} Average household income (₹ per annum)
		b) Annual inflation rate based on average of last 5 years
		c) Total number of bank branches
		d) Number of factories registered under the Factories Act
		e) Availability of bus station for passenger services
		 f) Availability of railway station for passenger and goods services
		g) Availability of number of national highways connecting the Village with rest of the region/ nation
		h) Availability of number of national water ways for goods transportation
		j) Village product as a percentage of district's GDP
		 k) Employment percentage change based on the last 5 years
iv)	Government	 a) Type of government (for example, panchayat, village council, municipality, cantonment board, industrial area authority, regional authority, etc)
		_{b)} Gross operating budget (₹ in crore)
		_{c)} Gross operating budget per capita (₹)
V)	Geography	a) Region
	and Climate	b) Climate type
		c) Land area (square kilometres)
		 d) Area under natural resources, such as forests, water bodies, hills/hillocks, natural drainage systems and changes in past 5 years
		e) Percentage of non-residential area (square kilometres)
		f) Number of native species
		g) Annual average temperature(C°)
		h) Average annual rain (mm)
		j) Average annual snowfall (cm)
		k) Is the ground water receding?
		 m) Area and population experiencing natural hazard risks during past 5 years

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