Vol. No. PDOS-XXXVII No. (3-4)
ISSN 2249-197X

सर्वेक्षण

SARVEKSHANA

112th Issue
March, 2022

Journal of
National Statistical Office

Government of India
Ministry of Statistics and Programme Implementation
National Statistical Office
New Delhi
www.mospi.gov.in

SARVEKSHANA

112th Issue

Journal of
National Statistical Office

Government of India
Ministry of Statistics and Programme Implementation
National Statistical Office
New Delhi

Journal of National Statistical Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI)

Editorial Secretariat–Survey Coordination Division, National Statistical Office, Ministry of Statistics and Programme Implementation, Sankhyiki Bhawan, Delhi-110032.

Smt. Pravin Horo Singh, Additional Director General, NSO (SCD)
Ms. Noushida N.A., Director, NSO (SCD)
Shri Chetan Yangjor, Deputy Director, NSO (SCD)
Shri Ram Prakash, Senior Statistical Officer, NSO (SCD)

Frequency and Subscription
'Sarvekshana' is generally published twice a year and is made available on the website of the Ministry for free download. The subscription rate for hard copy is ₹ 300 per copy. For subscription mail to: Controller of Publications, Department of Publication, Civil Lines, Delhi - 110054. Ph. 23819689, 23817823

Submission of papers/articles for Sarvekshana
'Sarvekshana' is aimed at encouraging research and analysis of NSS, Census, ASI data and other official statistics to bring about a deeper understanding of statistical data. For details about submission of papers/articles, refer to back of cover page.

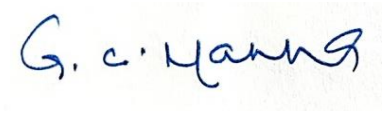
Suggestions for improvement of the Journal may be addressed to:
The Managing Editor, Sarvekshana,
Survey Coordination Division
National Statistical Office, MoSPI
Sankhyiki Bhawan, Maharshi Valimiki Marg, Delhi - 110032

Foreword

Bringing out *Sarvekshana* has always been a pleasant and enlightening endeavour. The first issue of *Sarvekshana* was released during July, 1977 and the latest released issue of *Sarvekshana* is the combined one of 110th &111th issue. The present 112th issue comes with three papers on the subjects of (i) Measurement of Completion Rate of Education in India, (ii) Under Listing of Establishments in Sixth EC: A Comparison between Sixth EC and NSS Conducted on Non-agricultural Enterprises and (iii) Role of the Indian System of Medicine and Homeopathy in Treating Communicable and Non-communicable Diseases in India. In addition, the highlights of Reports of NSS 77th Round have also been included in the 112th issue.

Referees have been very kind in examining the papers in detail and offering their suggestions in a short span of time. So have been the Members of the Editorial Advisory Board. I offer my sincere gratitude to them and solicit continued support for the Journal. Authors of the papers too have been cooperative in acceding to the suggestions for repetitive revisions. I congratulate them for their work which we hope would be useful. Officers of Survey Coordination Division of National Statistical Office have been meticulous at various stages of publication and their hard work deserves unqualified appreciation.

The *Sarvekshana* is a known Journal among researchers, academicians and policy makers. I welcome students, researchers, government officials and all those working on data based on censuses and sample surveys to contribute papers for this Journal.



New Delhi
April, 2022

Chairman
Editorial Advisory Board

Contents

PART-I

TECHNICAL PAPERS

Measurement of Completion Rate of Education in India

Akhilesh Kumar[1], Vibeesh E. M[2] and Priyanka Sethi[3]

Abstract

Achieving inclusive and quality education for all reaffirms the belief that education is one of the most powerful and proven vehicle for sustainable development. The Sustainable Development Goal 4 is aimed at ensuring that all girls and boys complete primary and secondary schooling by 2030, which can be possible through data driven policy framework and targeted interventions. For the policy, it is important to assess the completion rate of education. In this paper an attempt has been made to compute the completion rate at different level of education. The unit level data of Socio-Economic Surveys on Household Social Consumption on Education (71st round conducted in year 2014 and 75th Round conducted during 2017-2018) conducted by National Statistical Office has been used in the paper. Analysis reveals that the SDG global indicator 4.1.2 which is on completion rate pertaining to primary education, lower secondary education, upper secondary education, can be a better indicator as compared to current national indicator 4.1.2 which is a Gross Intake Ratio to the last grade for primary education, upper primary, secondary education.

Key Words: SDGs, completion rates, gross intake ratio to last grade, drop-out rate, national indicator framework.
JEL CODE: I20, I29
Date of Receipt of Final Version of Paper from Author: March, 2022
Date of Acceptance: March, 2022

[1] Director, Development Monitoring and Evaluation Office, NITI Aayog, email: akhilesh.kumar99@gov.in
[2] Director, RO, FOD, Coimbatore, Kerala, MoSPI, email: vblu81@gmail.com
[3] Deputy Director, DMEO, NITI Aayog, New Delhi, email: priyanka.sethi@gov.in
The views expressed, herein, are solely of the authors and not of the organization/office where he/she is serving.

1. Introduction

Education is a human right and fundamental for achieving full human potential, developing an equitable and just society, and promoting national development National Education Policy 2020 (NEP, P 1). It also emphasised to ensure universal access and provide opportunity to all children of the country to obtain quality holistic education–including vocational education - from pre-school to Grade 12 (NEP, P 10).

United Nations adopted the 2030 development agenda with 17 Sustainable Development Goals (SDGs) with associated 169 targets aims to address not only the root causes of poverty but also the universal need for development to provide a life of dignity to all. The global education development agenda, reflected in the SDG 4 aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all by 2030. This goal is of immense importance due to its transformative effects on the other SDGs as education enables upward socioeconomic mobility[4].

A robust follow-up and review mechanism for the implementation of the 2030 Agenda for Sustainable Development requires a solid framework of indicators and statistical data to monitor progress, inform policy and ensure accountability of all stakeholders. In this connection, the global indicator framework was adopted by the General Assembly on 6 July 2017. Presently, there are 247 indicators in the global indicator framework which includes 231 unique indicators[5].

Towards adoption and localisation of the framework, the Ministry of Statistics and Programme Implementation (MoSPI), Government of India developed a National Indicator Framework (NIF) for India in 2018 consisting of 306 National indicators. Presently, there are 308 indicators in the NIF (Version 3.0)[6].

One of the important targets of Goal 4 is target 4.1, which seeks to ensure that all girls and boys complete free, equitable and quality primary and secondary education. In SDG Global Indicator Framework (GIF), indicator 4.1.1 [Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex] and indicator 4.1.2 [Completion rate (primary education, lower secondary education, upper secondary education)] have been adopted to monitor the target 4.1[7].

Among these two indicators, SDG indicator 4.1.2 measures the percentage of children aged 3-5 years above the intended age for the last grade of each level of education who have completed that grade. A completion rate of 100% indicates that all children and adolescents have completed a level of education by the time they are 3 to 5 years older than the official age of entry into the last grade of that level of education. A low completion rate indicates low or delayed entry into a given level of education, high drop-out, high repetition, late completion, or a combination of these factors[8]. It

[4] *UNICEF, https://data.unicef.org/sdgs/goal-4-quality-education/*
[5] *Statistical Division, Department of Economic and Social Affairs*
[6] *SSD, MoSPI, Sustainable Development Goal, National Indicator Framework Version 3.0*
[7] *Statistical Division, Department of Economic and Social Affairs*
[8] *UNICEF, https://data.unicef.org/sdgs/goal-4-quality-education*

reflects how policies on access to and progression through the early grades of education impact the final grade of the given level. SDG indicator 4.1.2 along with indicator 4.1.1 helps to measure minimum proficiency in reading and mathematics.

Government of India currently through SDG National Indicator Framework (NIF) is measuring SDG target 4.1 using a set of seven indicators. One among them is "Indicator 4.1.2 - Gross Intake Ratio to the last grade (primary education, upper primary, secondary education)". The indicator is defined in NIF as the number of students qualified/ passed of a given grade (at last grade of education level) to the number of students appeared to that grade. The data used by MoSPI for the number of students passed and appeared in classes V, VIII and X is an administrative data set from Unified District Information System for Education (UDISE), Ministry of Education. This indicator considers as partial match to global SDG indicator 4.1.2 (completion rate) [9].

The United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics defines "Gross Intake Ratio to the last grade (GIRLG) for primary education, upper primary, secondary education" as the total number of new entrants into the last grade of education, regardless of age, expressed as a percentage of the population at the intended entrance age to the last grade of primary, upper primary, secondary education". A high ratio indicates a high degree of current (level) education completion. It also indicates the capacity of the education system to cater for the completion of the population of the intended entrance age to the last grade of the given level of education. It assumes that pupils entering the last grade for the first time will eventually complete the grade and hence the given level of education[10].

We can clearly observe that the definition of the national indicator (4.1.2) does not match the international standards for the same indicator as there is a serious deviation in the denominator in NIF definition which only uses the children enrolled and appearing in the last grade of education and ignores UNECSO's prescribed denominator as population of intended age group to the last grade of education. To begin with the analysis, this observation itself is of great concern because it may not be able to provide a macro view to the education sector as it limits itself to a microscopic view on the internal efficiency of the school systems and thereby reducing the denominator which leads to an upward bias in the final value of the indicator or in simple terms it would cause an overestimate towards completion as it ignores out of school children.

As per UNESCO Institute for Statistics, there are some limitations of GIRLG viz., measuring the capacity of the education systems for completion of education level rather than measuring completion in a specific group and this may sometimes exceed 100%, due to over-aged or under-aged pupils entering the last grade of primary school for the first time which may again lead to an overestimate towards completion[11]. These limitations may be addressed to a great extent in the Completion rate as it allows for some delayed entry or repetition.

[9] *MoSPI, Sustainable Development Goals Progress Report 2021*
[10] *UNESCO Institute for Statistics, https://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/education/intake_education.pdf*
[11] *UNICEF, https://data.unicef.org/sdgs/goal-4-quality-education*

This paper is the maiden attempt to compute the global indicator 4.1.2 completion rate of education at different levels using survey results of National Statistical Office. The paper is organized into seven sections. Section two and three relate to the data and methodology adopted for computation of the indicator. Section four is on results of data analysis while section five is on rationale behind using this indicator. Section six is on limitation of the indicator and its estimates. Detailed discussion and conclusions have been made in section seven of the paper.

2. Data

Data for computation of this indicator has been taken from Socio-Economic Survey on Household Social Consumption on Education (SE Survey -HSC(E)) of National Statistical Office conducted in 75th round during July, 2017 to June, 2018. Prior to this, the SE Survey -HSC(E) was conducted in 71st round during January, 2014 to June, 2014.

The survey covered both qualitative and quantitative aspects related to educational attainment of the household members and educational services used by them. Qualitative aspects included literacy, educational level attained, type of institution, nature of institution, current attendance/enrolment, free education, reason for never enrolled/ever enrolled but currently not attending, etc. On quantitative aspects, information was also collected on expenditure incurred on education of the household members by the household itself, by other households or by any institutions/organizations other than Government.

For the both rounds, the sampling design is same which is stratified multi-stage design with the first stage units (FSU) as the Census villages (Panchayat wards for Kerala) in the rural sector and Urban Frame Survey (UFS) blocks in the urban sector. The ultimate stage units (USU) were households in both the sectors. The first stage units were drawn following Probability Proportional to Size with Replacement (PPSWR), size being the population of the village as per Census 2011. For the urban sector, FSUs were selected by Probability Proportional to Size with Replacement (PPSWR)[12], size being number of households in Urban Frame Survey Blocks in urban areas.

The sample size for the 75th round was 14,285 FSUs (8,097 villages in rural areas and 6,188 Urban Frame Survey Blocks in urban areas) covering 1,13,757 households (64,519 in rural areas and 49,238 in urban areas) and enumerating 5,13,366 persons (3,05,904 in rural areas and 2,07,462 in urban areas). Whereas the sample size for the 71st round was 8,297 FSUs (4,577 in rural India and 3,720 Urban Frame Survey Blocks in urban areas) covering 65,926 households (36,479 in rural areas and 29,447 in urban areas)[13].

3. Methodology

The global SDG Indicator 4.1.2, completion rate is a percentage of a cohort of children or young people aged 3-5 years above the intended age for the last grade of each level of education who have completed that grade. UNESCO Institute for Statistics has well established methodology for

[12] Key Indicators of Household Social Consumption on Education in India, NSS 75th and 71st Round, MoSPI
[13] Key Indicators of Household Social Consumption on Education in India, NSS 75th and 71st Round, MoSPI

calculation of the indicator. An attempt has been made to apply this methodology using data from National Statistical Office.

Following four steps are involved in the computation of completion rate at the All-India and States level, separately for rural - urban area and other parameters.

3.1 Computation of Intended Age,
3.2 Computation of $P(Age_{a+3t5})$, where $P(Age_{a+3t5})$ is population aged 3 to 5 years above the official entrance age (a) into the last grade of level *n* of education,
3.3 Computation of $P(C_n, Age_{a+3t5})$, where $P(C_n, Age_{a+3t5})$ is population aged 3 to 5 years above the official entrance age (a) into the last grade of level *n* of education who completed level *n* i.e., $P(C_n, Age_{a+3t5})$,
3.4 Computation of Computation of CR_n, where CR_n is completion rate of a level *n* of education.

3.1. Computation of Intended Age

The intended age for the last grade of each level of education is the age at which pupils would enter the grade if they had started school at the official primary entrance age, had studied full-time and had progressed without repeating or skipping a grade.

For calculation, as the official age of entry into primary education is 6 years and primary education level has 5 grades, hence the intended age for the last grade of primary education is 10 years. Furthermore, 13-15 years (10 + 3 = 13 and 10 + 5 = 15) is obtained as the reference age group for calculation of the primary completion rate[14].

Intended age for the last grade of each level of education *n* i.e. $Ind_{age(n)} = a_n + (G\text{-}1)_n$

Where, a_n = Official entry age for education level n and G = Number of grades of education level n

Also, in case of India, it observed that the minimum age for admission to class-I is generally 5 to 6 years. The minimum age for admission to Class I is 5 years in 26 States and UTs viz; Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Manipur, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand, West Bengal, Andaman & Nicobar Islands, Chandigarh, Dadra & Nagar Haveli, Daman & Diu, Delhi, and Puducherry. And in the remaining States and UTs, the minimum age for admission to class I is 6 years (viz., Bihar, Maharashtra, Meghalaya, Mizoram, Nagaland, Punjab, Sikkim, Tripura and Lakshadweep). In this background and Indian Standard Classification of Education, the paper uses entry age to class I as 6 years[15].

Using International Standard Classification of Education (ISCED) 2011 and Indian Standard Classification of Education (InSCEO) 2014, mapping of Indian education level vis-à-vis international level has been done and (refer to Annex-I), the intended age is arrived as follows:

[14] Statistical Division, UNSD, https://unstats.un.org/sdgs/metadata/files/Metadata-04-01-02.pdf
[15] Selected Information on School Education in India 2011-12, Department of School Education & Literacy

$$Ind_{age}(n) = \begin{cases} 10\ years: \ if\ n = \text{Primari Education (Class I to V), Official Entry age in 6 Years} \\ 13\ years: if\ n = Lower\ \ Seconday\ Education\ (Class\ VI\ to\ VIII), Official\ Entry\ age\ in\ 11\ Years \\ 17\ years: \text{If n = Upper Secondary Education (Class IX to XII), Official Entry age is 14 Years} \end{cases}$$

3.2. Computation of P(Age$_{a+3t5}$)

Population aged 3 to 5 years above the official entrance age (a) into the last grade of level n of education i.e., P(Age$_{a+3t5}$),

$$P(Age_{a+3t5}) = \sum w \times I(Ind_{Age(n)} + 3 \leq age(n) < Ind_{age(n)} + 5)$$

For the above estimation, following would be a formula for calculation of P(Age$_{a+3t5}$)[16]:

$=\sum w \times I(13 \leq age < 15)$; *for primary level of education.*
$=\sum w \times I\ (16 \leq age < 18)$; *for lower secondary level of education. Similarly*
$=\sum w \times I\ (20 \leq age < 22)$; *for upper secondary level of education.*
where,
w is household level survey-based weights,
I(.) is the indicator function implying 1, if the condition is satisfied and else 0;
age is age of the person.

3.3. Computation of P(C$_n$, Age$_{a+3t5}$)

Population aged 3 to 5 years above the official entrance age (a) into the last grade of level n of education who completed level n i.e., P(C$_n$, Age$_{a+3t5}$). The P(C$_n$, Age$_{a+3t5}$) is calculated by following formula:

$$P(C_n, Age_{a+3t5}) = \sum w \times I(Ind_{Age(n)} + 3 \leq age(n) <_{Ind_{age(n)}} + 5) \times I(Edu\_level)$$

Using above formula, P(C$_n$, Age$_{a+3t5}$) for different level of education is obtained as follow:

(i) For primary level of education= Age between 13 years to 15 years, currently enrolled or ever enrolled with formal education of primary level or above,

$$=\sum w \times I(13 \leq age < 15) \times I(Formal\ eduation\ of\ primary\ level\ or\ above) \times I(Currently\ enrolled\ or\ ever\ enrolled)$$

(ii) For lower secondary level of education= Age between 16 years to 18 years, currently enrolled or ever enrolled with formal education of upper primary/middle level or above,

$$=\sum w \times I\ (16 \leq age < 18) \times I(Formal\ eduation\ of\ upper\ primary/\ middlelevel\ or\ above) \times I(Currently\ enrolled\ or\ ever\ enrolled)$$

Similarly,
(iii) For upper secondary level of education= Age between 20 years to 22 years, currently enrolled or ever enrolled with formal education of secondary level or above,

[16] *Item 5, BL-4, Schedule -25.2 is age of Household member*

$$= \sum w \times I\,(20 \leq age < 22) \times I(Formal\ eduation\ of\ secondary\ level\ or\ above)$$

$$\times\ I(Currently\ enrolled\ or\ ever\ enrolled)$$

where,
w is household level survey-based weights,
I(.) is the indicator function implying 1, if the condition is satisfied and else 0;
age is age of the person,
Edu_level grade/class completed at n level of education
n = ISCED level 1(Primary education), 2(lower secondary education), or 3(upper secondary education)
a = Official age of entry for n level of education

3.4. Computation of CR_n

Completion rate CR_n is computed as the number of children in the reference age group who have completed the last grade of a given level of education out of total reference aged children. Mathematically,

$$CR_n = \frac{P(Cn, Agea+3t5)}{P(Agea+3t5)} \times 100$$

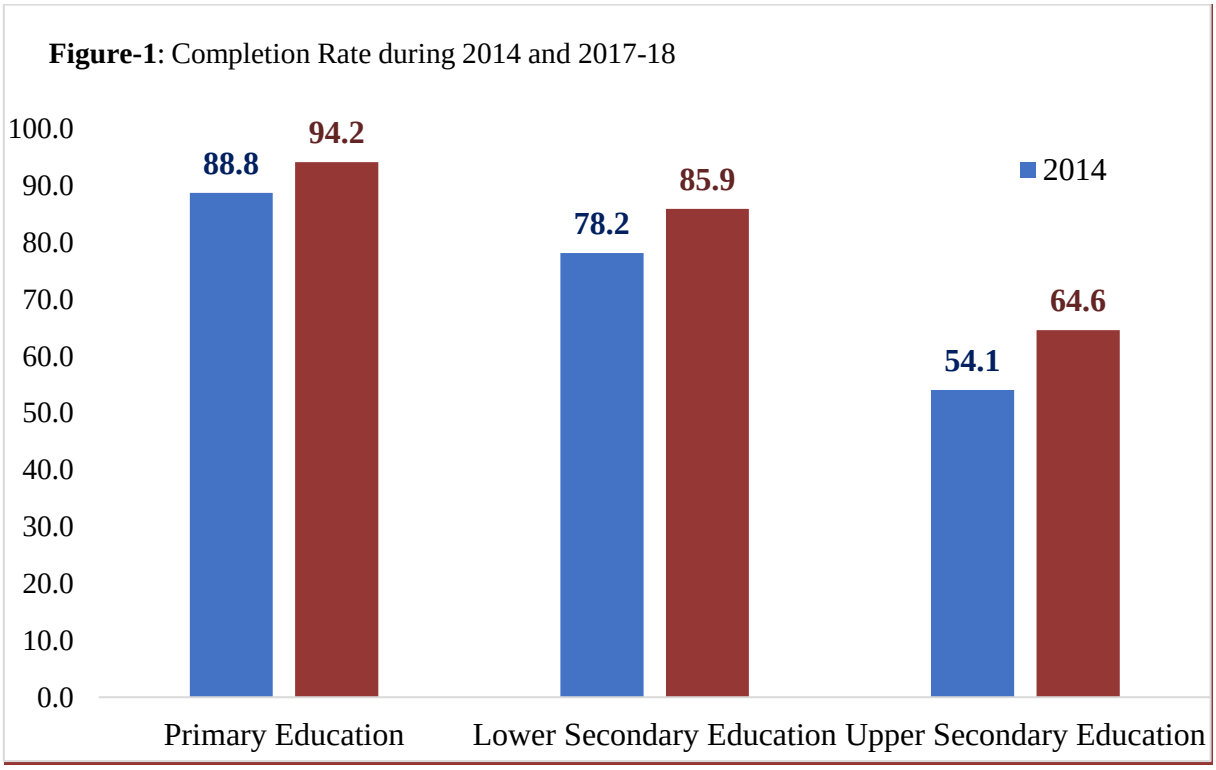
4. Results

The analysis of completion rates has been discussed at the All-India level by trying to understand the overall scenario, trends in data, associations with area and gender. Also, out of all factors affecting the completion rate, an attempt has been made to understand the indicator's association with drop-out rates, gross enrolment rates, out of school children nationally and sub-nationally.

4.1. Analysis at All-India Level

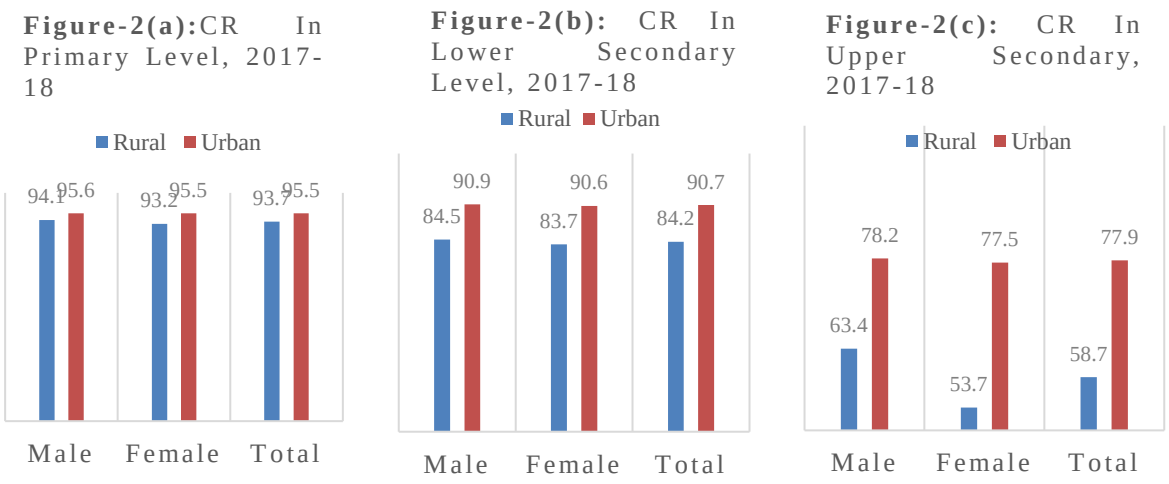
From 2014 to 2017-18 an overall rise is observed in the completion rate of school education across Primary, Lower secondary and Upper Secondary levels (Figure-1). This can be attributed to the concentrated efforts within the education centered schemes such as Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA) along with the Mid-Day Meal scheme (MDM) backed with a strong legislative measure of Right to Education (RTE) which have resulted in improved student participation and completion in school education[17].

[17] *Department-related parliamentary standing committee on Human Resource Development. Accessed from http://164.100.47.5/newcommittee/reports/EnglishCommittees/Committee%20on%20HRD/283.pdf*



Source: Based on authors' calculation from unit level data of 71st and 75th Round NSS

Further, it is observed that the completion rate for primary level education, 94.2%, is the highest among the three levels of education during 2017-18. This signifies that most of the children have completed class fifth by the time they are 13 to 15 years old. The completion rate for lower secondary was calculated as 85.9% which further may have a cascading effect on the completion rate of upper secondary education due to a further delayed entry, high drop-out, high repetition, late completion, high no. of out of school children or a combination of these factors, reducing it to 64.6% for the entire country during 2017-18 [Figure-1].



Source: Based on authors' calculation from unit level data of 75th NSS

Further understanding the gender wise rural-urban divide in the completion rates, one may clearly notice, on drawing comparisons amongst the rural and urban areas, that the completion figures are

significantly less for rural areas when compared to the urban, the gap increases as we go up in the ladder of the education levels. Also, the same trend is observed on doing a gender wise comparison across these areas. Completion rate for both the males and females in rural areas have observed as lower than that of Urban. Within the same geographic area(rural/urban), the completion rates of male are slightly higher than female in rural areas where as they almost coincide in urban areas. This gap increases further at upper secondary level due to higher drop-out rates in rural areas [Figure-2(a), 2(b) and 2(c)].

This may be due to fact that children living in rural areas tend to drop-out of school earlier than those who live in urban areas. As per the U-DISE data, the GER is low at the lower Secondary Education level (88.27 per cent) and is considerably low at the upper secondary level (48.13 per cent). Also, the stage at which maximum number of students are observed to be dropping-out of school is at secondary levels. The UDISE data suggests that the drop-out rates at upper primary and secondary level have increased over the last four year period, while the drop-out rate at primary level showcased marginal decrease. In 2017-18, 19% of children dropped out before completing secondary classes, 5% before finishing upper primary school while 3.5% children drop out before finishing primary school[18] [Table-8**]**.

Also, there are still considerable number of 'Out-of-School (OoSC)' children in the country and majority of the mainstreamed 'OoSC' didn't have adequate participation. In 2014-15, over 17.24 lakh out-of-school children were identified of whom 11.83 lakh were enrolled into elementary schools. By 2017-18, the number of out-of-school children had dropped to 8.34 lakh, of whom 6.7 lakh children were enrolled into elementary schools. As of 2017-18, around 1.63 lakh children remain unenrolled in elementary schools[18]. As per the NSS data, this problem is mostly specific to certain regions. Of the 50.94 lakh children identified as out-of-school during this period (2014-15 to 2017-18), over 45 per cent of the children were identified in the three states of Rajasthan, Bihar and Jharkhand respectively. By 2018-19, Rajasthan and Jharkhand were able to effectively reduce the number of out-of-school children in their respective states by almost 70 percent [19][75th NSS, MoSPI, 2017-18]. While the number of OoSC has reduced over the last few years, however, a survey commissioned by Ministry of Education in 2014 indicates that around 56 per cent of the mainstreamed Out of School children did not complete their elementary education indicating a

[18] *U-DISE, Department of School Education & Literacy, Ministry of Education, https://dashboard.udiseplus.gov.in/#/reportDashboard/sReport*
[17]*U-DISE, Department of School Education & Literacy, Ministry of Education, https://dashboard.udiseplus.gov.in/#/reportDashboard/sReport*
[18]*Key Indicators of Household Social Consumption on Education in India, NSS 75th Round (2018), Ministry of Statistics and Programme Implementation, http://www.mospi.gov.in/sites/default/files/publication_reports/KI_Education_75th_Final.pdf*
[19]*Key Indicators of Household Social Consumption on Education in India, NSS 75th Round (2018), Ministry of Statistics and Programme Implementation, http://www.mospi.gov.in/sites/default/files/publication_reports/KI_Education_75th_Final.pdf*
[20]*Department of School Education & Literacy, Ministry of Education*
[21]*Department-related parliamentary standing committee on Human Resource Development. Accessed from http://164.100.47.5/newcommittee/reports/EnglishCommittees/Committee%20on%20HRD/283.pdf*

huge gap in the overall intervention and lack of their adequate inclusion [20][Department of School Education, Ministry of Education].

This is a matter of great concern. In many ways schools are not equipped to handle the full population – there is a teacher shortage in primary schools, lack of functional girls' toilets and access to drinking water. Also, on the demand side the key reasons for drop-out includes engagement in household chores (30 per cent), early marriage (13 per cent) and lack of interest in education (15 per cent) for the female child. While for the male child, engagement in wage earning activities (37 per cent) and economic considerations (24 per cent) accounts for around two-third of the households' reasons for student drop-out[21] [75th NSS, MoSPI, 2017-18]. Gender and cost of schooling therefore may have significant impact on drop-out rates.

These education statistics on drop-out rates, enrolment rates and out of school children resonate with the low completion rates of secondary education. In later part of this section, an analysis of the effect of high drop-outs and movement of Gross Enrollment rates in the overestimation of completion of last grade of different levels by GIRLG as compared to the completion rate has been attempted.

Further an in-depth analysis on completion rates at different levels of education among various socio-economic parameters is illustrated below:

4.1.1 Primary Level of Education

To understand the Completion Rates (CRs) according to economic status, CRs in primary level have been calculated for each quintile class of Monthly Per Capita consumption Expenditure. It is observed that for both rural and urban areas, CR for primary level is less in lower quintiles (89.7%-rural & 84.9%-urban in 1st Quintile) and increases as we move up in quintiles (98% in 5th Quintile). It is interesting to know that up to 3rd quintile, primary level CRs in Rural areas (89.7%, 93.3% & 95.1% in 1st, 2nd & 3rd Quintile respectively), is higher as compared to urban areas (84.9%, 89.7% & 91.4% in 1st, 2nd & 3rd Quintile respectively) [Table-1(a)].

Table-1(a): Quintile Class and Area-wise CR in Primary Level, 2017-18

Monthly Per Capital consumption Expenditure	Rural	Urban
1st Quintile	89.7	84.9
2nd Quintile	93.3	89.7
3rd Quintile	95.1	91.4
4th Quintile	96.8	96.9
5th Quintile	97.9	98.4
Total	**93.7**	**95.5**

In both rural and urban areas, higher completion rates were observed in households belonging to regular wage and salary earning. In rural area, completion rate was lowest among household belonging to casual labour in non-agriculture (89.8%). It is observed that completion rates among the rural agricultural households (94.6%) are higher as compared to rural non-agricultural

households (93.6%). It is also observed that completion rate of self-employed households was lower in rural areas (94.6% in agriculture & 93.6% in non-agriculture) as compared to urban areas (96.0%) [Table-1(b)].

Table-1(b): Household Type and Area-wise CR in Primary, 2017-18	
Rural	
Self-employed in agriculture	94.6
Self-employed in non-agriculture	93.6
Regular wage/salary earning in agriculture	96.6
Regular wage/salary earning in non-agriculture	96.7
Casual labour in agriculture	92.5
Casual labour in non-agriculture	89.8
Others	95.7
Rural(total)	**93.7**
Urban	
Self-employed	96.0
Regular wage/salary earning	97.0
Casual labour	92.1
Others	93.3
Urban(total)	**95.5**

Table-1(c): Social Group and Area -wise CR in Primary Level, 2017-18		
Social Group	**Rural**	**Urban**
Scheduled Tribe (ST)	91.6	95.7
Scheduled Caste (SC)	94.0	93.4
Other Backward Class (OBC)	93.2	95.3
Others	95.7	96.7
Total	**93.7**	**95.5**

Social group-wise analysis of CRs reveals that except SCs, CRs are lower in rural areas for all other social groups compared to that of urban areas. CRs of primary level belonging to social categories other than SC, ST, OBC are reported higher compared to remaining social groups for both rural as well as urban areas [Table-1 (c)].

Table-1 (d): Religion and Area-wise CR in Primary Level, 2017-18		
Religion	**Rural**	**Urban**
Hinduism	94.8	97.1
Islam	86.3	88.9
Christianity	95.1	98.5
Sikhism	98.1	96.6
Jainism	100.0	100.0
Buddhism	98.9	100.0
Others	94.9	98.9
Total	**93.7**	**95.5**

Further religion-wise analysis reveals that CR of primary is lowest in Islam religion as compared to other religions. The highest CRs are reported in Jainism followed by Buddhism. In Sikhism religion, CR in primary is higher in rural area (98.1%) as compared to urban areas (96.6%) during 2017-18 [Table-1(d)].

This rate at primary level is extremely important to be as close to 100 as possible since it also reflects access to basic education. Also, more importantly, low primary completion

signifies a delay of completion at all further levels as, primary completion is a prerequisite for secondary enrolment, and secondary completion a prerequisite for tertiary enrolment, the roots need to be kept strong for the overall development.

4.1.2 Lower Secondary

It observed that for both rural and urban areas, CR of lower secondary education is less in lowest quintile class and increases as we move up in quintile classes (94.3%-rural & 96.7%-urban 5th Quintile class. It is interesting to note that up to the 4th quintile class, CRs in Rural areas (76.4%, 82.2%, 86.2% & 91.2% in 1st, 2nd, 3rd & 4th Quintile classes respectively) is higher as compared to urban areas (75.5%, 79.5%, 83.9%, 90.1% & 90.1% in 1st, 2nd, 3rd & 4th Quintile classes respectively) [Table-2(a)].

Table-2(a): Quintile and Area-wise CR in Lower Secondary Level, 2017-18

Monthly Per Capital Consumption Exp.	**Rural**	**Urban**
1st Quintile	76.4	75.5
2nd Quintile	82.2	79.5
3rd Quintile	86.2	83.9
4th Quintile	91.2	90.1
5th Quintile	94.3	96.7
Total	84.2	90.7

Table-2(b): Household Type & Area-wise CR in Lower Secondary, 2017-18

Rural	
Self-employed in agriculture	87.4
Self-employed in non-agriculture	87.3
Regular wage/salary earning in agriculture	83.7
Regular wage/salary earning in non-agriculture	92.1
Casual labour in agriculture	75.8
Casual labour in non-agriculture	76.3
Others	86.3
Rural(total)	**84.2**
Urban	
Self-employed	90.8
Regular wage/salary earning	92.9
Casual labour	82.7
Others	96.4
Urban(total)	**90.7**

In rural, higher completion rate was observed in households belonging to Regular wage/salary earning in non-agriculture (92.1%) followed by self-employed in agriculture (87.4%) and self-employed in non-agriculture (87.3%) during 2017-18. In both rural and urban area, completion rate was the lowest among household belonging to casual labour. Unlike primary, in lower secondary level higher completion rates were observed in Regular wage/salary non-agriculture households as compared to Regular wage/salary agriculture households in rural areas. [Table-2(b)].

Social group-wise analysis of CRs reveals that CRs of lower secondary education is lower in rural areas across all social groups compared to that of urban areas. CR of lower secondary level for children belonging to general castes are reported higher as compared to remaining social groups viz., SC, ST and OBC for both rural as well as urban areas. Among social groups, lowest CR was observed among STs in rural (76.8%) and SCs in urban (86.6%) [Table 2(c)].

Table-2(c): Social Group and Area-wise CR in Lower Secondary Level, 2017-18

Social Group	**Rural**	**Urban**
Scheduled Tribe (ST)	76.8	88.2
Scheduled Caste (SC)	82.3	86.6
OBC	85.4	90.3
Others	88.1	93.4
Total	**84.2**	**90.7**

Table-2(d): Religion and Area-wise CR in Lower Secondary Level, 2017-18

Religion	**Rural**	**Urban**
Hinduism	86.6	93.9
Islam	68.4	78.1
Christianity	82.1	97.2
Sikhism	93.1	93.2
Jainism	100.0	100.0
Buddhism	95.0	94.9
Others	76.0	89.3
Total	**84.2**	**90.7**

Further religion-wise analysis reveals that CR of lower secondary is lowest in Islam religion as compared to other religions. 100% CRs are reported in Jainism followed by Buddhism. Unlike all religions where higher CRs were reported in urban areas as compared to rural areas, among Sikh households, CRs were almost the same both for rural (93.1%) and well as urban area (93.2%) [Table-2(d)].

4.1.3 Upper Secondary

It observed that for both rural and urban areas, CR of upper secondary education is significantly low in 1st quintile (45.9%-rural & 51.4%-urban) and increases as we move up in quintiles (85.3%-rural & 88.5%-urban 5th Quintile). It is interesting to know that in 4th quintile, CR in rural areas (73.1%) is slightly higher as compared to urban areas (71%) [Table-3(a)].

Table-3(a): Quintile and Area-wise CR in Upper Secondary Level, 2017-18

Monthly Per Capital consumption Expenditure	**Rural**	**Urban**
1st Quintile	45.9	51.4
2nd Quintile	52.7	63.1
3rd Quintile	57.8	63.8
4th Quintile	73.1	71.0
5th Quintile	85.3	88.5
Total	**58.7**	**77.9**

Table-3(b): Completion Rate in Upper Secondary, 2017-18	
Rural	
Self-employed in agriculture	64.1
Self-employed in non-agriculture	63.8
Regular wage/salary earning in agriculture	50.2
Regular wage/salary earning in non-agriculture	75.2
Casual labour in agriculture	43.9
Casual labour in non-agriculture	42.7
Others	72.8
Rural(total)	**58.7**
Urban	
Self-employed	76.4
Regular wage/salary earning	82.1
Casual labour	60.4
Others	94.9
Urban(total)	**77.9**

In rural households, higher completion rate was observed in households belonging to Regular wage/salary earning in non-agriculture (75.2%) followed by self-employed in agriculture (64.1%) and self-employed in non-agriculture (63.8%) during 2017-18. In both rural and urban area, completion rate was lowest among household belonging to casual labour, however higher CR was observed in urban area (60.4%) as compared to rural areas (agriculture (43.9%) & non-agriculture (42.7%). For all other occupational households, i.e., households which do not have any income from economic activities, completion rate was observed to high i.e., 72.8% [Table-3(b)].

Social group-wise analysis of CRs reveals that CRs of upper secondary education is lower in rural areas across all social groups compared to that of urban areas. CR of upper secondary level of children belonging to ST in rural areas (41.7%) and SC in urban areas (70.5%) is lowest as compared to all other social groups. [Table- 3(c)].

Table-3(c): Social Group and Area-wise CR in Upper Secondary Level, 2017-18		
Social Group	**Rural**	**Urban**
Scheduled Tribe	41.7	72.2
Scheduled Caste	54.4	70.5
OBC	61.2	77.0
Others	67.8	82.8
Total	**58.7**	**77.9**

Further religion-wise analysis reveals that CR of upper secondary is also lowest in Islam religion as compared to other religions. It is also observed that across all religions, completion rate in rural areas is lower as compared to urban areas. The highest CRs are reported in Jainism followed by Sikhism and Buddhism. [Table-3(d)].

Table-3(d): Religion and Area-wise CR in Upper Secondary Level, 2017-18		
Religion	**Rural**	**Urban**
Hinduism	61.3	81.3
Islam	41.0	62.7
Christianity	54.8	85.9
Sikhism	77.0	89.5
Jainism	95.3	98.9
Buddhism	73.9	89.0
Others	63.5	78.1
Total	**58.7**	**77.9**

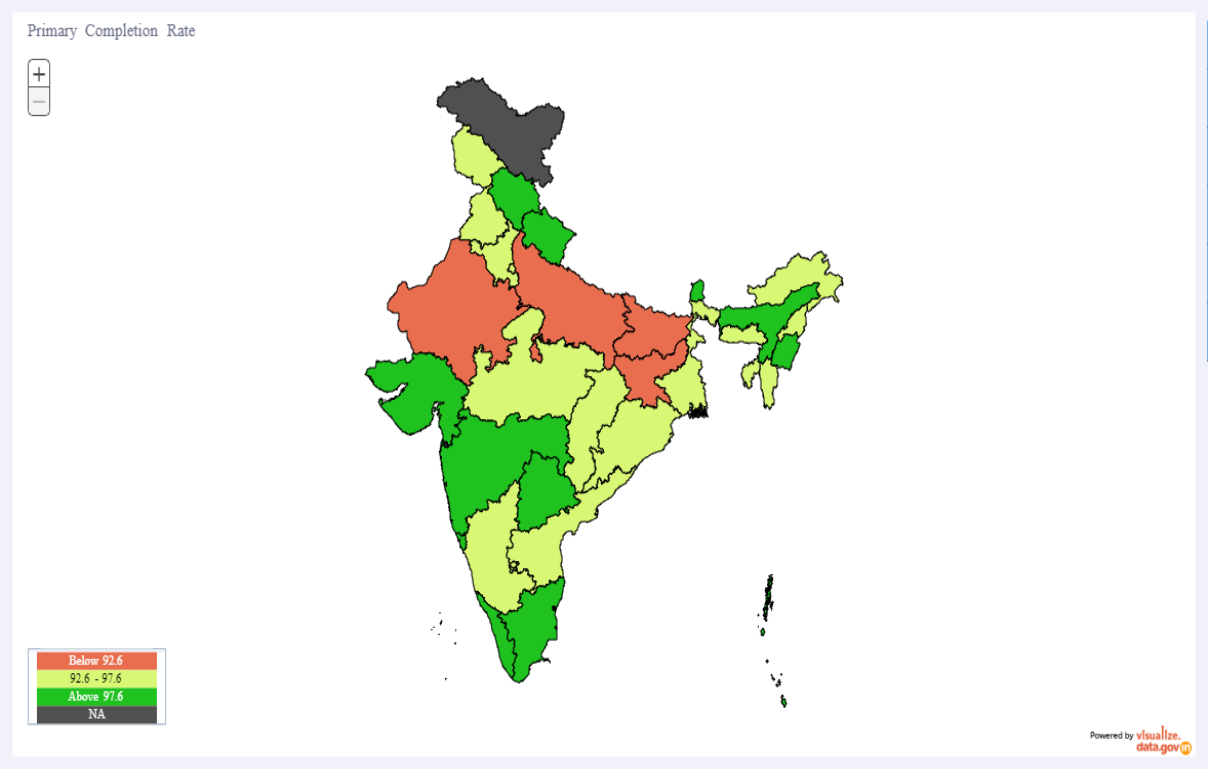
4.2. Analysis at State Level

State/UT-wise patterns of completion in different level of educations are presented below:

4.2.1 Primary Level of Education

When analyzing the completion rates at the primary education level, it is observed that majority of the States/UTs (30 out of 36) have higher or equal CRs than the national average of 94.2%. Highest performers with a score of 99.5% were Kerala, and Tamil Nadu, with the highest literacy levels, followed by Himachal Pradesh, Sikkim, and Goa [Figure-3].

Figure-3: Completion Rate in primary education, 2017-18



The area of concern here would be the bottom performers affecting the national performance of the indicator viz., Uttar Pradesh (87.6%), Rajasthan (90.3%), Bihar (91.1%) and Jharkhand (92.1%), most of them having lowest literacy levels (as per 2011 census). As per the National Statistical Office (NSO)'s 2017-18 data on out of school children, Bihar still has one of the highest out of school children, and also has a drop-out rate of 5% which is much above the national figure of 3.5%[22]. On comparing the completion rates of 2017-18 with that of 2014, it is observed that 28 out of 36 states/UTs have shown improvement at the primary level. Deterioration in performance at this level for the remaining 8 states/UTs on an average is around 2 percentage points. Despite its

[22] *Department-related parliamentary standing committee on Human Resource Development. Accessed from http://164.100.47.5/newcommittee/reports/EnglishCommittees/Committee%20on%20HRD/283.pdf*

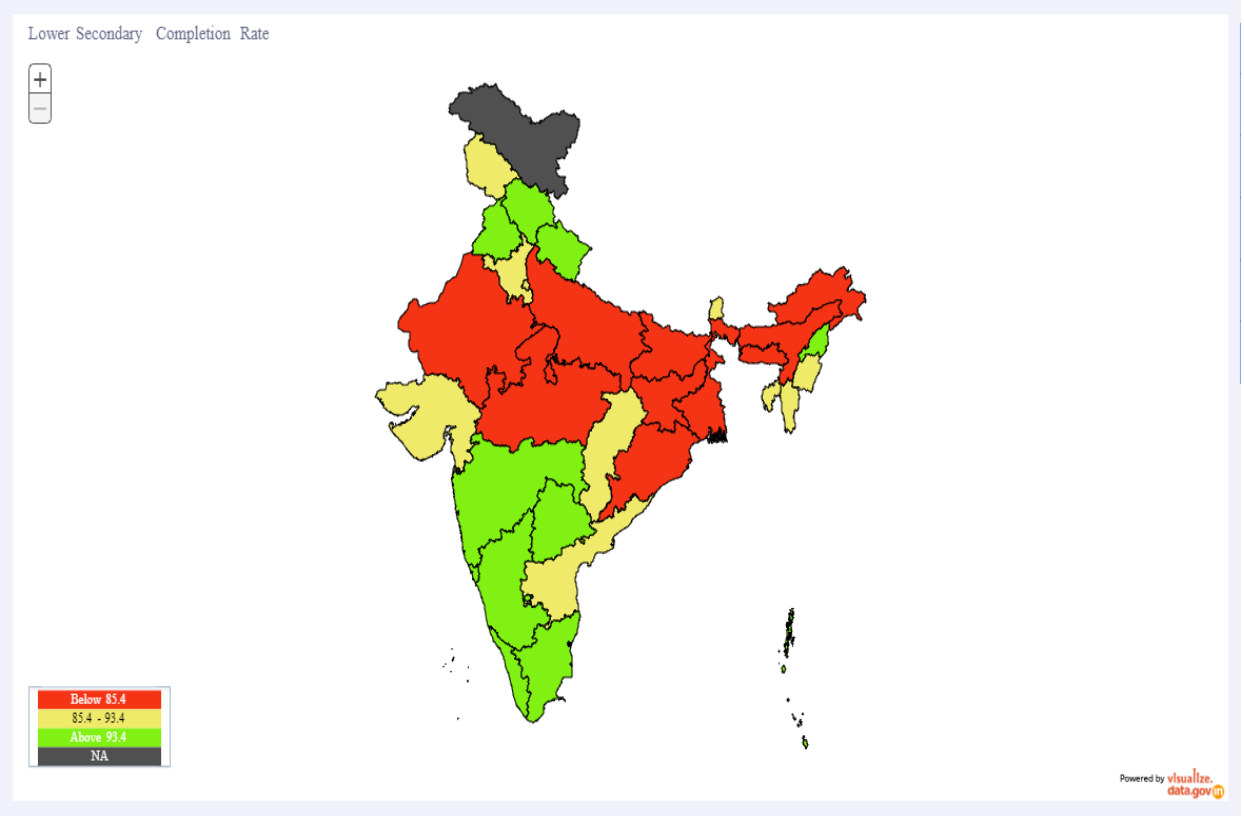
current position, Bihar has shown significant improvement. The lowest CRs in both rural and urban areas were observed in Uttar Pradesh with a completion rate of less than 90% across males & females. The same was observed among females in Rajasthan [Table-4 & Table-5].

4.2.2 Lower Secondary Level of Education

At the lower secondary level, most of the States (25 out of 29) have higher or equal completion rate compared to the national average of 85.9%. Due to the cascading effect the best performer states are the ones whose primary completions were around 100%. The worst performers being Uttar Pradesh and Meghalaya. The female completion rate of less than 80% are reported in Arunachal Pradesh (74.7% in rural & 72.9% in urban), Bihar (75.8% in rural), Jharkhand (77% in rural), Madhya Pradesh (78.4% in rural), Meghalaya (74.8% in rural), Rajasthan (74.8% in rural), Uttar Pradesh (79.1% in rural & 76.5% in urban) during 2017-18 [Table-6].

On comparing the lower secondary completion rates of 2017-18 with that of 2014, it is observed that 30 out of 36 States/UTs have shown improvement in completion rates at primary level. Significant improvement has been seen in the States of Rajasthan (+16.26%); Bihar (+28.55%), West Bengal (+18.32%), Chhattisgarh (+14.41%) and Puducherry (+18.22%), among others. Deterioration in performance at this level has been observed in Arunachal Pradesh (-10.08%) and Nagaland (-3.49%) [Table-4].

Figure-4: Completion Rate for Lower Secondary Level, 2017-18



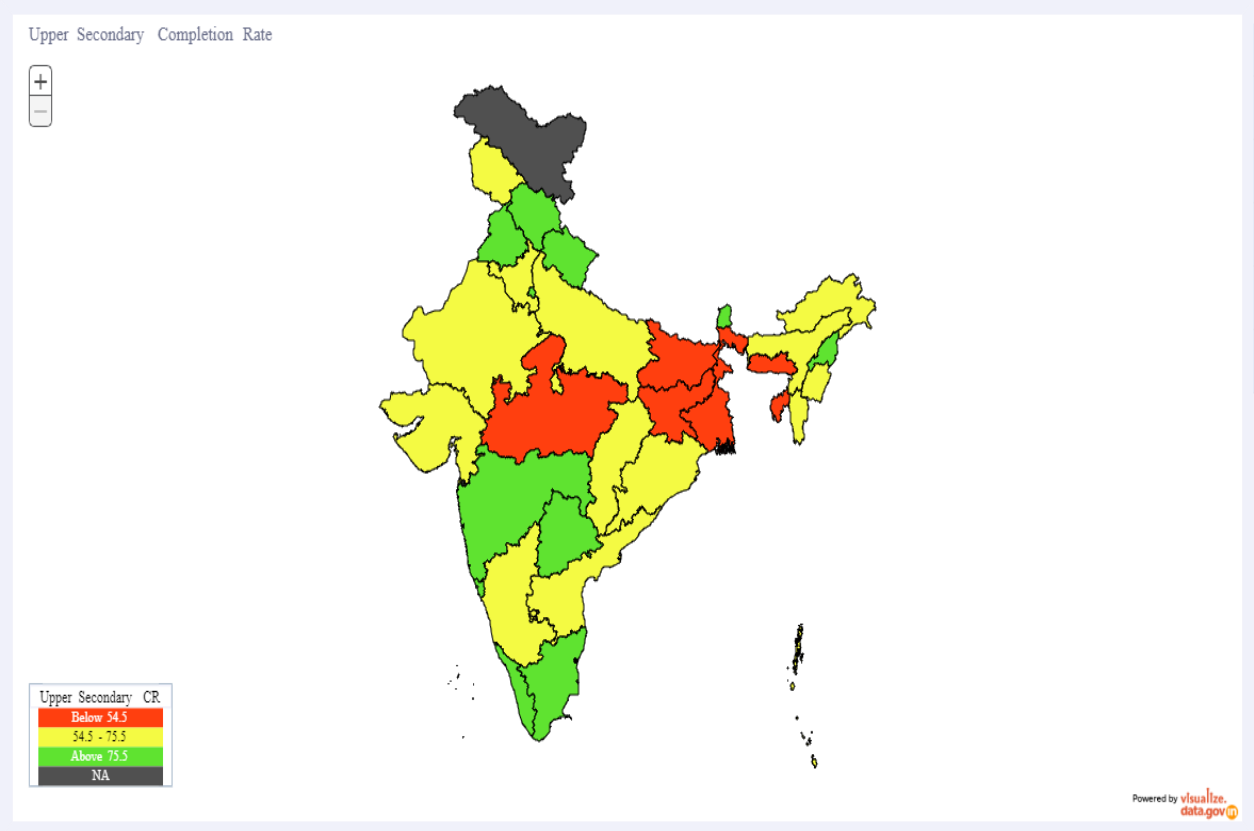
4.2.3 Upper Secondary Level of Education

At the upper secondary level, only 21 out of 36 States/UTs had higher or equal completion rate than the national average of 64.6%. The low values of completion at lower secondary education level contribute to this below par level. Kerala, Chandigarh, Tamil Nadu and Puducherry have been the best performers at this level, as they were also at primary and lower secondary. It can be seen that Tripura and Bihar are lagging behind significantly [Figure-5]

Lowest completion rate of upper secondary was reported primarily among rural female. These States are Tripura (29.7%), Jharkhand (31.7%), Madhya Pradesh (33.9%), Bihar (37%), West Bengal (42.1%), Meghalaya (42.7%), Rajasthan (46.4%), Gujarat (47.9%) and Odisha (48.9%) during 2017-18. There were some States which have less than 50% completion rate for upper secondary level among males. These States were Tripura (29.4%), Mizoram (35.1%), Meghalaya (38.7%) and Madhya Pradesh (48.4%) [Table-7].

On comparing the upper secondary completion rates of 2017-18 with that of 2014, it was observed that 27 out of 29 states have shown improvement in completion rates at upper secondary level. However, the quantum of improvement has been the highest at this level [Table-4].

Figure-5: Completion Rate for Upper Secondary Education Level 2017-18



On seeing the whole picture together, it is observed that in 2017-18, India has seen an improvement of 6.08%, 9.85% and 19.41% in completion rates of primary, lower secondary and upper primary levels respectively from 2014. Also, the same trends in terms of the quantum of improvement have been visible on an average in most of the states. Taking a deep-dive into trends in noteworthy

performance of States, while many states have improved, Bihar which is still behind the national average, has shown some significant improvement across all levels of education, on an average of 12 points from 2014; Also, Nagaland is above national average, however its performance has declined marginally at all levels.

Primary school enrolment being a success story in most states, largely due to various programs and drives to increase enrolment even in remote areas. This along with low drop-outs, high enrolments and other factors like low repetitions, less delaying etc. at primary stage, contributes to the high levels of completion even sub-nationally. Likewise, at secondary stage the values of drop-outs, repetitions etc. increase in general across States thereby impacting the completion rates. All these trends, especially at secondary levels raise concerns about sectoral interventions having desired impact on the ground highlighting a considerable scope for improvement.

5. Rationale behind adopting global SDG Indicator 4.1.2

An attempt has been made to understand the associations of completion rate with GIRLG, gross enrolment rates and drop-out rates and draw conclusions on the importance of the indicator w.r.t SDG.

5.1. SDG Target 4.1

The indicator is clearly indicated in the content of SDG target 4.1 representing completion of primary and secondary education by all girls and boys. This indicator along with global SDG indicator 4.1.1 measures children achieving a minimum level of proficiency [metadata 4.1.2, SDG-UNSD].

5.2. Pass out Percentage for Students in the Official Age Group

Table-5(a): Passing out % for Student in Official Age Group, 2017-18

Region	Class I	Class II	Class III	Class IV
Rural	46.4	47.3	43.4	44.6
Urban	49.3	41.5	36.9	45.2
Total	**45.8**	**45.9**	**41.7**	**44.8**

Pass out percentage = (Number of student completed a grade/official population age above one year of that grade)×100

As per NSS 75th round data, less than 50% of children were able to complete the grade as per their defined official age groups. Such figures in grades like VI, VII and IX is very low. [Table-5(a)]. Similar patterns were also found for primary, lower secondary and upper secondary. Hence it would be prudent to consider the intended age group, 3 to 5 years above the official age group for any grade to measure true level of completion for that grade.

5.3 Comparison of Completion Rate vis-à-vis Gross Intake Ratio to the Last Grade

The completion rates in case of States of Kerala, Tamil Nadu and Goa, having high literacy rates as well high enrolment rates, is higher than GIRLG at both primary and lower secondary levels. However, in most of other States where either drop-outs are considerably higher and/or gross enrolment rates are relatively low, Gross in-take Ratio of NIF is seriously overestimating the

completion levels at both primary and lower secondary levels. The reason behind this overestimation is that Gross in-take Ratio of NIF focuses only on appearing students in the last grade in the respective education level and does not take into account the reasons effecting the magnitude of coverage of school population like drop-outs in previous grade, low enrolments, out of school children etc. [Table-8].

Similarly, while analysing UDISE data for 2017-18 on drop-outs and GER, we observed that, the upper secondary education level faces some pivotal problems related to extremely high level of drop-outs with a national average of 19% and exceptionally low enrolment rates with a national figure of 48.13% in 2017-18[23]. Using the empirical evidence from primary and lower secondary level, the theory is yet again established that the GIRLG would be overestimating the true completion rates at this level with an even higher magnitude.

At all three levels of education, it has hence been empirically established that with high drop-out rates and either extremely low GER, the indicator on GIRLG overestimates the true completion level of the last grade thereby causing serious problems in the education sector if one decides to use such an indicator for monitoring the access and success achieved in different education levels. Also, it has further been established that, this problem has been addressed by the global indicator 'Completion Rate' as it allows for some delayed entry or repetition by allowing 3-5 years above the official entry age.

5.4 Comparison of Completion Rate Published in SDG Global Database with the one Computed using NSS Data

UNESCO Institute for Statistics is a custodian agency and is responsible for providing the data for this indicator.

Table-5(b): Comparative Completion Rate

Education Level	IHDS 2011*	NSS 2014	DHS 2016$	NSS 2017-18
Prima	88.35	89	91.58	94.15
Lower Secondary	76.13	78	80.84	85.93
Upper Secondary	34.98	54	42.89	64.59

Source: *"*" University of Maryland and National Council of Applied Economic Research's Indian Human Development Survey and "$" National Family Health Survey, IIPS, MoHFW*
Note: *CR calculated using NSS has been converted into percentage to make it comparable with globally published SDG data*

While comparing the completion rates computed using the NSS data sets with the available data for India in the SDG global data base for the closest year possible, it was observed that the data for primary, lower secondary and upper secondary shows a similar trend, however values computed using NSS data show a better completion status as compared to IHDS and DHS from NFHS. This primarily may be due to the fact the NSS 75th round is a focused survey on education sector. Whereas the NFHS is mainly themed on health and family welfare and IHDS being a multi-purpose

[23] *U-DISE, Department of School Education & Literacy, Ministry of Education, https://dashboard.udiseplus.gov.in/#/reportDashboard/sReport*

panel survey focuses on full range of human development issues including income, consumption, health, education, employment, social networks, gender relations etc. Thereby indicating that education statistics are majorly a by-product of these two surveys. Also, both these surveys are not being conducted at fixed time intervals as their frequency ranges from 5-10 years.

On the other hand, NSS 75th round on household social consumption on Education is a survey solely focused on building indicators on the education system in the country. Therefore, providing more sector specific and relevant information.

Hence considering the relevance of surveys, frequency of availability of data and consistency of data, it may be appropriate to use the NSS datasets on household social consumption on education to compute the indicator on completion rate for the global SDG database.

6. Limitations

Following are limitation with completion rate:

(i) In case of late joining of school or high repetition, some children in the age group may still attending the schooling and, in that situation, the completion may be underestimated. Besides, as the indicator is calculated using household survey, data may not be available on annual basis[24].

(ii) Comparison of NSS 71st round and 75th Round surveys results may not be proper as NSS 71st Round had a survey period of six months only (January, 2014 to June 2014) compared to the survey period of one year for NSS 75th round (July, 2017 to June, 2018).

(iii) Due to small sample size of transgender, the data of transgender has been shown under male gender.

(iv) The entry age for each level of education may vary from States to States. Besides, classification of age and education grade of Indian Standard Classification of Education, 2014 might not be exactly same as that of International Standard Classification of Education (ISCED) 2011. Mapping of both educational classification is given at Table-9, Annex-I.

7. Discussion and Conclusions

This paper is a maiden attempt to compute the completion rate of school education in India at the National and sub-national (States/UTs) level across all 3 education levels (Primary, Lower Secondary, Upper Secondary) using unit level data from the Survey on Household Social Consumption- Education collected by the NSO. The core conclusion of the paper is that the United Nations Statistical Division (UNSD)'s identified indicator, completion rate, defined as per the international standards, can be considered and included in the National Indicator Framework as this indicator is of paramount significance in order to understand the children's access and participation in education.

The low levels of secondary education may result in considerably reduced pool of students available for higher education because the selection of those entering university is depends upon the successful upper secondary attainment. Further it may also have an impact on quality of

[24] *United Nations, https://unstats.un.org/sdgs/metadata/files/Metadata-04-01-02.pdf*

education as missing enrolment and drop-out are sometimes determined by the factors other than ability e.g., location, gender or socio-economic background. These factors may have a negative effect on quality of higher education as well[25]. Further, completing upper secondary education is also associated with higher work participation thereby having positive impacts on the country's economy as the education and training of a country's workforce is a major factor in determining how well the country's economy will perform. It, therefore, becomes imperative to monitor such an indicator to ensure timely social as well as economic growth.

GIRLG is important in assessing the internal efficiency of a school system for children who have effective access to school, however, it gives no idea on the magnitude of coverage of the eligible school population[26]. For example, in Uttar Pradesh, it has a 100% Gross intake rate for Grade 8 but only 79% completion rate in class 8, showing good number of students out of school. As India suffers from high drop-out rates especially at secondary level, it is therefore important to consider the relevance of this indicator in Indian context as well. In addition to the high drop-out rates, in 2018-19 as per NSS's data, India had 1.6 lakh out of school children. Also, as per a survey commissioned by Ministry of Education in 2014, 56 per cent of the mainstreamed Out of School children did not complete their elementary education indicating a huge gap in the overall intervention and lack of their adequate inclusion. Both these scenarios would lead to serious overestimation of completion of education, if we use current proxy national indicator on Gross Intake Ratio as it does not take into account the out of school children, delays, drop-outs, repetitions etc. This is because the denominator of the Gross Intake Ratio is the number of children enrolled in school in place of eligible children to enter school. However, the suggested indicator, completion rate combines two dimensions to assess quality of education and access: it addresses whether or not the entire eligible school age population has access to school and whether or not they complete the full primary/secondary cycle.

Therefore, the national indicator (4.1.2) may overestimate the completion rates, leading to biased conclusions and showing a better picture than reality. Using overestimated figures would continue the denial of the problem by the stakeholders involved due to lack of information on actual happenings on ground thereby leading to ineffective policy interventions and either deterioration or status quo of education levels being maintained.

To summarise, four crucial criteria should be considered for an indicator to be a part of the NIF, viz, identification in the GIF, national relevancy, methodology and data availability and universal applicability. We will briefly revisit all criteria talked in detail in above sections to reflect the pre-eminence of the indicator:

Completion rate has been identified in the GIF to monitor progress against the target 4.1. Hence use of this indicator (CR) would ensure complete consonance with the SDG Global Indicator Framework of UNSD as it will further help in making cross-country comparisons. Besides, the data required for computation of this indicator is available in the Indian Official Statistical system. Also,

[25] *Michaelowa, Katharina. (2007). The impact of primary and secondary education on higher education quality. Quality Assurance in Education. 15. 10.1108/09684880710748956*.

[26] *United Nations, https://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/education/intake_education.pdf*

the methodology using Indian data sets has been mentioned by the authors in detail in section 3 above.

In view of the pre-eminence of the indicator in terms of policy relevance, monitoring and analysing the true performance to be able to successfully achieve the SDG goal 4, the paper concludes by proposing to include and use completion rates as computed above in the NIF against target 4.1 under SDG 4 by replacing the current national indicator 4.1.2 - Gross Intake Ratio to the last grade.

As, over the years the government has a greater inclination towards evidence-based policy making, it becomes all the more imperative to use 4.1.2 indicator as it would reflect the true performance and the true quantum of the completion of education level for the eligible population and hence necessitate the requisite policy interventions in the right direction with the right momentum to achieve inclusive and equitable education for all. It would help meeting the central transformative promise of the 2030 Agenda "Leaving No One Behind" and Indian Government's motto "Sabka Saath, Sabka Vikas, Sabka Vishwas".

Table-4: State/UT wise Completion Rate (%) for Primary Education, Lower Secondary Education and upper Secondary Education during 2017-18 over 2014

State/UT	Primary level		Lower Secondary		Upper secondary level	
	2014	2017-18	2014	2017-18	2014	2017-18
Andhra Pradesh	92.8	97.0	86.3	90.5	54.5	71.0
Arunachal	88.3	94.1	91.3	82.1	61.9	66.8
Assam	91.8	97.8	79.3	83.5	50.3	57.7
Bihar	78.5	91.1	62.0	79.7	40.4	47.9
Chhattisgarh	90.3	97.5	78.4	89.7	42.3	64.0
Goa	100.0	99.3	100.0	99.9	81.7	80.7
Gujarat	92.5	98.0	76.9	87.0	47.6	60.1
Haryana	90.9	96.8	84.3	86.0	56.9	74.7
Himachal	98.1	99.4	90.9	97.9	89.8	87.5
Jammu &	91.7	97.5	89.7	93.2	58.1	73.5
Jharkhand	86.1	92.1	80.7	81.6	48.5	53.6
Karnataka	94.6	97.4	84.2	94.6	64.1	73.5
Kerala	99.3	99.5	99.0	99.6	92.4	95.0
Madhya Pradesh	92.1	95.1	78.5	83.2	41.7	49.3
Maharashtra	93.4	98.4	87.5	93.5	66.8	75.5
Manipur	95.0	98.5	93.1	92.6	75.7	74.7
Meghalaya	88.4	93.6	64.7	77.4	45.7	51.1
Mizoram	94.2	96.3	84.2	91.0	48.5	59.8
Nagaland	97.6	96.4	97.3	93.9	86.6	76.4
Odisha	92.6	97.3	79.2	84.1	42.6	56.4
Punjab	87.5	97.4	87.1	93.8	64.6	77.5
Rajasthan	83.2	90.3	70.1	81.5	45.5	59.0
Sikkim	88.6	99.1	89.3	93.2	49.4	81.5

State/UT	Primary level		Lower Secondary		Upper secondary level	
	2014	2017-18	2014	2017-18	2014	2017-18
Tamil Nadu	98.8	99.5	97.3	98.9	72.8	87.8
Telengana	96.7	98.9	86.9	97.5	73.6	78.6
Tripura	98.3	97.4	84.3	86.2	41.2	33.5
Uttar Pradesh	80.7	87.6	72.3	79.0	52.4	61.4
Uttaranchal	100.0	97.9	90.0	97.6	82.9	79.9
West Bengal	92.2	94.6	71.5	84.6	42.3	51.0
A & N Islands	99.8	99.9	87.6	98.8	89.2	74.3
Chandigarh	97.4	91.9	96.0	95.6	81.3	96.5
D & N Haveli	85.3	100.0	77.2	80.9	62.7	72.4
Daman & Diu	61.6	99.3	92.6	90.4	34.6	29.3
Delhi	94.7	93.1	90.4	91.2	59.7	80.2
Lakshadweep	99.8	99.7	90.2	100.0	67.6	56.8
Puducherry	90.5	100.0	84.5	99.9	67.4	86.9
All India	**88.8**	**94.2**	**78.2**	**85.9**	**54.1**	**64.6**

Source: Based on Authors' Calculation from unit Level Data of 71st and 75th Round NSS

Table-5: State/UT-wise Completion Rate (%) by Gender, for Primary Education during 2017-18

State/UT	Rural			Urban		
	Male	Female	Total	Male	Female	Total
Andhra Pradesh	96.5	95.5	95.9	100.0	98.5	99.3
Arunachal Pradesh	93.7	93.6	93.6	95.6	97.3	96.2
Assam	98.1	97.2	97.8	99.8	95.2	97.7
Bihar	90.9	91.5	91.1	89.5	92.5	90.7
Chhattisgarh	96.4	98.4	97.3	98.5	98.2	98.4
Goa	97.4	99.5	98.8	99.5	99.2	99.4
Gujarat	97.1	98.1	97.6	99.1	98.3	98.8
Haryana	96.6	96.0	96.3	97.4	99.2	98.1
Himachal Pradesh	99.2	99.6	99.4	100.0	100.0	100.0
Jammu & Kashmir	100.0	94.7	97.6	99.7	94.1	97.2
Jharkhand	92.6	90.0	91.4	93.0	96.7	94.9
Karnataka	97.6	97.3	97.5	96.6	98.2	97.3
Kerala	99.8	99.9	99.9	99.0	99.1	99.0
Madhya Pradesh	95.3	93.3	94.4	97.2	97.6	97.4
Maharashtra	98.7	97.9	98.3	99.5	97.4	98.5
Manipur	99.6	96.6	98.0	99.0	99.5	99.2
Meghalaya	93.6	94.4	94.0	91.5	92.0	91.8
Mizoram	96.6	93.2	95.0	97.9	98.8	98.3
Nagaland	99.2	94.9	97.4	99.8	91.8	94.5
Odisha	96.9	97.2	97.0	98.4	99.5	98.8
Punjab	98.6	97.1	97.9	98.5	93.2	96.3
Rajasthan	92.5	87.3	90.0	94.0	89.0	91.6
Sikkim	100.0	100.0	100.0	93.4	100.0	96.5
Tamil Nadu	99.9	100.0	99.9	99.2	98.7	99.0
Telangana	98.6	99.5	99.0	99.9	97.6	98.9

State/UT	Rural			Urban		
	Male	Female	Total	Male	Female	Total
Tripura	96.6	98.4	97.4	95.4	100.0	97.1
Uttar Pradesh	89.6	86.1	88.0	82.7	89.0	85.7
Uttarakhand	97.6	98.8	98.2	97.5	96.2	96.9
West Bengal	90.6	97.3	93.9	95.6	98.6	97.0
A & N Island	100.0	100.0	100.0	100.0	99.5	99.8
Chandigarh	100.0	100.0	100.0	94.1	89.7	91.7
D&D	100.0	100.0	100.0	100.0	100.0	100.0
D&N Haveli	100.0	100.0	100.0	100.0	96.3	98.2
Delhi	100.0	100.0	100.0	95.4	89.4	92.9
Lakshadweep	100.0	98.5	99.1	100.0	100.0	100.0
Puducherry	100.0	100.0	100.0	99.9	100.0	99.9
All India	**94.1**	**93.2**	**93.7**	**95.6**	**95.5**	**95.5**

Source: Based on Authors' Calculation from Unit Level Data of 75th Round

Table-6: State/UT-wise Completion Rate (%) by Gender for Lower Secondary Education during 2017-18

State/UT	Rural			Urban		
	Male	Female	Total	Male	Female	Total
Andhra Pradesh	84.1	89.7	86.8	98.5	95.4	97.1
Arunachal Pradesh	87.3	74.7	81.9	90.7	72.9	82.9
Assam	83.5	79.9	81.9	98.0	93.2	96.1
Bihar	79.8	75.8	78.2	91.0	94.3	92.3
Chhattisgarh	87.8	88.9	88.3	95.1	97.4	96.3
Goa	100.0	100.0	100.0	99.6	100.0	99.8
Gujarat	83.7	84.4	84.0	91.9	94.7	93.0
Haryana	82.7	88.7	84.9	91.3	83.5	88.5
Himachal Pradesh	97.6	97.8	97.7	99.8	99.9	99.8
Jammu & Kashmir	97.4	91.6	94.6	89.8	83.5	87.3
Jharkhand	82.4	77.0	79.9	90.2	84.9	87.7
Karnataka	94.8	93.3	94.2	92.8	98.5	95.5
Kerala	99.2	100.0	99.5	99.9	99.8	99.8
Madhya Pradesh	84.3	78.4	81.5	88.7	88.4	88.6
Maharashtra	95.4	89.8	92.8	94.2	95.1	94.5
Manipur	92.0	94.1	92.9	92.4	91.4	92.0
Meghalaya	73.3	74.8	74.0	86.2	95.4	90.9
Mizoram	86.9	85.0	86.1	95.2	98.8	97.0
Nagaland	90.7	96.7	93.7	97.8	91.6	94.3
Odisha	83.0	81.8	82.5	91.5	98.6	95.1
Punjab	94.5	93.8	94.3	93.8	91.4	92.9
Rajasthan	81.8	75.4	78.9	91.6	86.3	89.3
Sikkim	92.1	97.5	94.7	99.3	80.9	89.1
Tamil Nadu	98.3	98.3	98.3	99.8	99.8	99.8

State/UT	Rural			Urban		
	Male	Female	Total	Male	Female	Total
Telangana	97.9	97.5	97.7	96.0	100.0	97.3
Tripura	84.4	85.3	84.8	89.4	95.6	92.8
Uttar Pradesh	78.7	79.1	78.9	81.5	76.5	79.2
Uttarakhand	100.0	96.6	98.4	93.6	95.4	94.5
West Bengal	80.4	90.5	85.1	79.1	86.7	82.8
A & N Island	97.2	100.0	98.1	99.7	100.0	99.8
Chandigarh	99.9	100.0	99.9	92.1	100.0	95.5
D&D	98.9	100.0	98.9	29.0	100.0	61.2
D&N Haveli	95.4	55.7	86.3	96.9	99.0	97.5
Delhi	88.4	100.0	96.2	88.6	94.0	90.9
Lakshadweep	100.0	100.0	100.0	100.0	100.0	100.0
Puducherry	100.0	100.0	100.0	100.0	99.7	99.9

Source: Based on authors' calculation from unit level data of 75th Round NSS

Table-7: State/UT-wise Completion Rate (%) by Gender for Upper Secondary Education during 2017-18

State/UT	Rural			Urban		
	Male	Female	Total	Male	Female	Total
Andhra Pradesh	73.3	62.8	68.1	83.7	72.8	77.6
Arunachal Pradesh	66.5	55.8	62.1	94.4	87.0	91.0
Assam	59.4	54.0	56.6	77.9	58.5	69.3
Bihar	54.8	37.0	45.3	83.0	62.0	72.0
Chhattisgarh	65.8	57.2	61.5	84.6	68.7	75.2
Goa	56.8	77.9	63.8	85.2	91.7	87.8
Gujarat	62.0	47.9	54.8	64.7	73.3	68.7
Haryana	73.2	70.7	72.0	79.0	82.1	80.5
Himachal Pradesh	91.1	84.7	87.6	96.1	78.6	86.3
Jammu & Kashmir	82.4	64.9	73.5	71.4	77.8	73.7
Jharkhand	59.9	31.7	46.1	81.2	78.5	79.9
Karnataka	70.9	56.9	64.8	86.5	90.4	88.2
Kerala	93.3	98.1	95.9	90.4	97.2	94.1
Madhya Pradesh	48.4	33.9	42.3	67.2	70.5	68.8
Maharashtra	71.6	67.6	69.9	82.8	81.2	82.0
Manipur	82.0	64.1	72.3	89.6	73.3	81.3
Meghalaya	38.7	42.7	40.7	96.7	90.7	94.0
Mizoram	35.1	56.6	46.4	82.9	71.5	77.4
Nagaland	60.5	72.8	66.0	86.7	96.5	90.9
Odisha	55.5	48.9	52.1	82.7	70.0	76.2
Punjab	79.7	75.0	77.8	73.3	83.2	77.1
Rajasthan	60.2	46.4	53.2	77.6	69.5	74.1
Sikkim	74.8	79.6	77.1	100.0	87.9	97.8
Tamil Nadu	83.6	83.1	83.3	90.4	93.2	92.1
Telangana	86.4	62.8	75.3	88.2	75.2	82.0
Tripura	29.4	29.7	29.5	42.6	59.8	51.3
Uttar Pradesh	62.1	55.8	59.2	70.0	67.6	68.9
Uttarakhand	79.7	77.3	78.5	86.2	80.4	83.5

State/UT	Rural			Urban		
	Male	Female	Total	Male	Female	Total
West Bengal	49.8	42.1	45.7	61.8	67.4	64.9
A & N Island	69.9	51.6	63.7	99.8	90.4	95.3
Chandigarh	100.0	64.9	89.5	100.0	88.7	96.6
D&D	73.4	91.8	81.2	73.6	54.4	70.6
D&N Haveli	26.5	1.1	16.7	53.3	89.9	56.5
Delhi	36.3	82.1	41.9	83.6	82.8	83.2
Lakshadweep	41.5	10.7	29.8	68.6	58.6	65.6
Puducherry	38.7	92.0	77.6	92.7	99.7	95.8
All India	**63.4**	**53.7**	**58.7**	**78.2**	**77.5**	**77.9**

Source: Based on authors' calculation from unit level data of 75th Round NSS

Table-8: Completion Rate, Gross in Take at Last Grade, Drop-out Rate, GER (Primary Education, Lower Secondary Education, Upper Secondary Education) during 2017-18 (All Figures in Percentages)

State/UT	Primary Level of Education				Lower Secondary Level of Education			
	CR$	GIRL G (5th std)*	Drop-out rate*	GER*	CR$	GIRL G (8th std)*	Drop-out rate*	GER*
Andhra Pradesh	97.0	66.1	0.0	94.4	90.5	94.4	0.2	85.8
Arunachal Pradesh	94.1	99.1	8.1	113.6	82.1	98.7	7.2	89.6
Assam	97.7	98.9	10.1	108.2	83.5	98.9	5.4	86.6
Bihar	91.1	99.6	5.1	99.5	79.7	96.9	13.3	79.9
Chhattisgarh	97.5	99.3	1.9	100.0	89.7	99.2	5.0	100.2
Goa	99.3	95.1	0.0	103.2	99.9	97.0	0.0	97.2
Gujarat	98.0	99.4	1.7	96.1	87.0	99.4	7.5	96.8
Haryana	96.8	99.0	0.0	102.9	85.9	99.4	0.4	96.2
H.P.	99.4	98.8	0.0	104.5	97.9	98.3	0.6	99.9
J&K	97.5	99.5	2.9	83.0	93.2	99.7	1.2	70.8
Jharkhand	92.1	99.0	0.0	103.9	81.6	99.3	0.0	83.9
Karnataka	97.4	94.6	1.7	106.2	94.6	92.9	2.6	93.7
Kerala	99.5	97.8	0.1	97.6	99.6	96.3	0.0	97.0
M.P.	95.1	92.8	4.0	97.7	83.1	91.5	6.4	90.6
Maharashtra	98.4	95.6	0.2	104.6	93.5	96.5	1.7	98.7
Manipur	98.5	98.5	3.4	119.3	92.6	99.5	0.5	85.3
Meghalaya	93.6	96.0	1.7	158.0	77.4	96.3	5.9	104.8
Mizoram	96.2	98.6	8.0	125.5	90.9	97.5	7.0	98.1
Nagaland	96.4	98.8	4.6	92.3	93.9	98.8	3.9	71.3
Odisha	97.3	98.3	5.8	99.2	84.1	98.6	5.4	92.3
Punjab	97.4	97.7	2.9	109.0	93.8	96.1	4.0	101.5
Rajasthan	90.3	99.4	3.4	105.6	81.5	99.6	2.8	88.9
Sikkim	99.1	98.5	0.0	98.5	93.2	98.5	0.0	102.2
Tamil Nadu	99.5	98.7	5.9	100.8	98.9	97.0	9.1	94.3

State/UT	Primary Level of Education				Lower Secondary Level of Education			
	CR$	GIRL G (5th std)*	Drop-out rate*	GER*	CR$	GIRL G (8th std)*	Drop-out rate*	GER*
Telangana	98.9	98.3	3.5	107.9	97.5	98.5	2.6	92.2
Tripura	97.4	97.2	0.9	108.8	86.2	97.9	2.6	98.4
Uttar Pradesh	87.6	99.9	7.2	106.0	79.0	99.9	7.4	75.3
Uttaranchal	97.9	98.3	3.4	111.7	97.5	97.7	2.4	96.5
West Bengal	94.6	100.0	0.2	101.7	84.6	100.0	0.0	93.0
A & N Islands	99.9	97.9	0.2	86.5	98.8	98.0	0.0	80.8
Chandigarh	91.9	98.0	0.0	92.8	95.6	96.3	0.0	104.8
D & N Haveli	100.0	97.7	0.1	91.7	80.9	98.1	2.3	87.2
Daman & Diu	99.3	90.9	0.4	99.7	90.4	92.4	1.7	81.8
Delhi	93.1	100.0	0.0	121.6	91.2	99.7	1.6	119.2
Lakshadweep	99.7	99.6	0.0	69.0	100.0	99.4	1.8	73.2
Puducherry	100.0	97.4	3.2	90.5	99.9	97.1	1.9	86.5
All India	**94.2**	**96.9**	**3.5**	**102.8**	**85.9**	**97.6**	**5.0**	**88.3**

Source: ''- UDISE Dashboard, Ministry of Education and '$' Based on Authors' Calculation from unit Level Data of 75th Round NSS. Note: For the sake of Comparability, CR is converted into Percentage.*

Annex-I

Table-9: Concordance of International Standard Classification of Education (ISCED) 2011 and Indian Standard Classification of Education (InSCEO) 2014

Indian Standard Classification of Education (InSCEO) 2014		International Standard Classification of Education (ISCED) 2011	
A	Pre-Primary (Age: 3 to 5 years)	**Level 0**	Early Childhood Education
B	Primary (Age: 6 to 10 years)(Grade – I to V)	**Level 1**	Primary
C	Upper Primary (Age -11 to 13 yrs)(Grade-VI to VIII)	**Level 2**	Lower Secondary
D	Secondary (Age: 14 to 15 yrs) (Grade – IX to X)	**Level 3**	Upper Secondary
E	Senior Secondary (Age:16 to 17 yrs) (Grade- XI to XII)		

Source: Indian Standard Classification of Education, Department of Higher Education, Ministry of Education

Table-10: Quintiles of per Monthly Per Capital consumption Expenditure (MPCE)

Quintile	MPCE (in Rs.)
1st Quintile	1,250
2nd Quintile	1,692
3rd Quintile	2,275
4th Quintile	3,333

Source: Based on authors' calculation from unit level data of 75th Round NSS

Definition of terms used:

1. Gross Enrolment Ratio (GER) of a particular grade is defined as total enrolment in that Grade regardless of age expressed as a percentage of official age group of that particular grade.

$$\text{GER} = \frac{Number\ of\ Enrolment\ in\ grade\ "x"}{Population\ as\ per\ official\ age\ group\ for\ that\ grade(x)} \times 100$$

2. Drop-out rate is defined as proportion of pupils from a cohort enrolled in a given grade at a given school year who are no longer enrolled in the following school year.

Acknowledgment

I would like to thank Dr. Sekhar Bonu & other DMEO colleagues, Dr. Prem Singh, NITI Aayog, Mr. Shailendra Sigdel, UNESCO, Dr. Manoj Kumar Pandey, Development Policy Centre, the Australian National University, anonymous referees and the Editorial advisory board of this journal who provided valuable feedback at multiple levels for revisions in this paper.

References

1. UNESCO, https:/openlearning.unesco.org/partners/17

2. Educational Consultants India Limited and Ministry of Human Resource Development. (2014). "National Sample Survey of Estimation of Out-of-School Children in the Age 6-13 in India".
3. Michaelowa, Katharina. (2007). "The impact of primary and secondary education on higher education quality". Quality Assurance in Education. 15.10.1108/09684880710748956.
4. Singh, Renu & Mukherjee Protap, (2015), "Determinants of Successful Completion of Secondary Education", Young Lives, University of Oxford.
5. Sylvie Kobzev Kotásková et al. (2018), "The impact of education on economic growth: the case of India", Volume 66 No. 29, pp 253-261.
6. Value for money from public education expenditure on elementary education in India (English). (2016) South Asia Region Education Global Practice Discussion Paper Series; no. 86. Washington, D.C.: World Bank.
7. UNESCO, 2019, "Global Education Monitoring Report: Migration, Displacement and Education: building bridges, not walls".
8. Geographical heat map of India generated with the help of Sh. Akhilesh Srivastava, Consultant, NIC using https://visualize.data.gov.in.
9. Indian Standard Classification of Education, Department of Higher Education, Ministry of Education, https://www.education.gov.in/sites/upload_files/mhrd/files/statistics/InSCED2014_1.pdf

Under Listing of Establishments in Sixth EC: A Comparison between Sixth EC and NSS Conducted on Non-agricultural Enterprises

Dipankar Mitra[1]

Abstract

The quality of Economic Census (EC) results hinge upon seriousness, dedication and honesty of enumerators and supervisors. Notwithstanding the sample inspections done by Central and State organizations, the results of EC are cross validated by using information available with alternative sources such as National Sample Survey (NSS) results conducted on unincorporated non-agricultural enterprises, figures given by Electricity Department and District Industries Centre in order to increase credibility of the information collected in the Census. Irrespective of these precautions the results of EC may be dubious. This study attempts to check the validity of number of establishments as enumerated in EC and compare the results with the relevant estimates generated by various Enterprise Surveys (ESs). The investigation has been done at State level as well as at broad activity level separately for rural and urban areas additionally for both Own Account Enterprises (without any hired worker) and establishments (with at least one hired worker). After exploration it has been found that EC has under listed OAEs at both State and broad activity level in rural and urban areas compared to the average number of enterprises estimated by ESs.The investigation has also been done at district level of few larger States with high level of under listing. The reliability of NSS estimates is also checked before comparison to show the credibility of NSS estimates.

Keywords: Economic Census, Enterprise Surveys, Under Listing, Cross-Validation, Reliability
JEL Code: C13, L60, N60, N70
Date of Receipt of Final Version of Paper from Author: April, 2022
Date of Acceptance: April, 2022

[1]Assistant Director, D/o Animal Husbandry & Dairying, M/o Fisheries, Animal Husbandry & Dairying (email: dipankar.mitra22@gmail.com). The views expressed are personal and not of the organization to which the author belonged.

1. Introduction

Indian economy has been broadly classified into two sectors, namely, Agricultural and Non-Agricultural sectors. The former has fairly reasonable database whereas for Non-Agricultural sector such a reliable data base is much needed. Considering the contribution of non-agricultural sector to the economy and non-availability of basic frame for adoption in various sample surveys to collect data relating to non-agricultural enterprises, conducting Economic Census was felt necessary. With this background, the EC was introduced – with the first EC conducted way back in the year 1977 – for preparing frame of establishments, particularly the 'area frame' which could be used for various surveys for collection of detailed data, mainly on non-agricultural sector of the economy. The basic purpose of conducting the EC was to prepare a frame for follow up surveys intended to collect more detailed sector specific information between two economic censuses. It is the prime source of up-to-date activity wise information on number of establishments and number of persons employed therein for all sectors including their distribution at all-India, State, district, and at village/ward/block levels.

The data collected through any field inquiry is subjected to certain amount of error, that normally creeps in due to the error committed by the investigator or the respondents or due to under coverage of enumerated units. A massive operation like the EC is no exception, where some amount of error is inevitable considering the fact that a large number of enumerators and supervisors are engaged in the collection of data on all economic activities (agricultural and non-agricultural), in spite of the best of the intentions and efforts to collect the accurate data. Although certain improvements were made in the schedule canvassed in the sixth EC to guard against under-listing of establishments (particularly the home-based units or those operating without fixed structure), data may be subject to some non-sampling error on account of such under-listing, which is difficult to eliminate totally in a massive census operation but the percentage of under listing can be minimized. But before minimizing it the knowledge of under listing at different levels would be required.

Most of all the Central & States ministries have adopted data quality assurance propaganda in their policies and schemes to improve the quality, efficiency and user relevance of statistics produced by them. In the same line, the quality of EC results hinge upon seriousness, dedication and honesty of enumerators and supervisors. Unlike EC, the results of Population Census are validated by a sample survey called Post Enumeration Survey (PES) conducted immediately after the census in order to assess the coverage and quality of the census enumeration. But in absence of this kind validation in case of EC, it becomes necessary to check the information provided by EC with some other sources. As part of the investigations, it was felt that some case studies are needed in this direction to improve quality of EC results.

Since EC is used as 'list frame' and 'area frame' for the follow-up ES, it may be useful to validate the results of EC with some available information. This paper is a stepping-stone to set rules for validation of EC results with some other data sources. In the present study the percentage of under coverage of establishments in the 6th EC has been arrived at by comparing its results with those based on 67th and 73rd rounds of NSS, conducted on Unincorporated Non-agricultural Enterprises (excluding Construction). For validity of such a comparison, few assumptions about the population model and estimates have been specified in Appendix.

2. Economic Census (EC)

Economic Census (EC) is the complete count of all establishments (i.e., units engaged in production and/or distribution of goods and services not for the purpose of sole consumption) located within the geographical boundaries of the country. Unlike NSS it provides information on number of units and workers by industry at disaggregated level.

The First Economic Census was conducted throughout the country, except Lakshadweep, during 1977 in collaboration with the States/Union Territories (UTs). The subsequent Censuses were conducted in the years 1980, 1990, 1998, 2005. The latest EC for which information is available is Sixth EC which was conducted during January, 2013 to April, 2014 in all the States and Union Territories of the country in collaboration with State/UT Governments. The area frame based on Sixth EC has been used for the 73rd round of National Sample Survey (NSS).

3. Enterprise Survey (ES) for Unincorporated Non-Agriculture Sector

The unincorporated sector in the Indian economy has prime importance. Besides its contribution to GDP, the sector is important on account of the number of enterprises in this sector and the very large number of persons depended on it for their employment. National Statistical Office (NSO) is conducting ESs as follow up surveys of Economic Census (EC), periodically, since the first EC. So far 15 such follow up surveys on non-agricultural enterprises have been conducted starting from the survey on Unorganized Manufacturing-Non-Directory Establishments and Own-Account Enterprises during NSS 33rd round (July 1978-June 1979) to the Survey on Unincorporated Non-Agricultural Enterprises (Excluding Construction) of NSS 73rd round (July 2015-June 2016). The main objective of the unincorporated non-agricultural enterprise surveys conducted by NSSO is to get estimates of various economic and operational characteristics of unincorporated non-agricultural enterprises in manufacturing, trade and other service sector (excluding construction) at National and State level. The surveys are designed to estimate value of key characteristics like number of enterprises, average number of workers, fixed assets, outstanding loans, total receipts, total operating expenses and gross value added

separately for 'Own Account Enterprises (OAEs)' and 'establishments' (hereinafter referred to as estt.)[2].

The NSS 67th round (July 2010-June 2011) was also devoted to the survey on non-agricultural unincorporated enterprises belonging to three sectors viz., Manufacturing, Trade and Other Services those not registered under the Factories Act., 1948. NSS 67th round was the first NSS round which covered the entire unincorporated non-agricultural sector (excluding construction) in a focused way as a follow-up survey of 5th EC. Under the above sectoral coverage, enterprises were categorized into two types, the first type being Own Account Enterprises (OAE) i.e., those enterprises that do not employ hired workers on a fairly regular basis in the reference year and the second type being Establishments (estt.). Establishments (estt.) employing at least one hired worker on a fairly regular basis in the reference year.

The survey on Unincorporated Non-Agricultural Enterprises (Excluding Construction) of NSS 73rd round (July 2015-June 2016) was conducted as a repeat survey of NSS 67th round (July 2010-June 2011) survey on the same subject.The coverage of NSS 67th and 73rd round[i] is almost similar except few like activities related to Non captive electric power generation, transmission and distribution by units not registered with the Central Electricity Authority (CEA) under NIC 2008 codes 35103, 35105, 35106, 35107, 35109, which were not covered in NSS 67th round are included in the coverage of NSS 73rd round.

4. Data Analysis

As per the results of the Sixth Economic Census (Table-1), there are 58.50 million establishments (59.48% in rural and 40.52% in urban) in the country engaged in different economic activities other than crop production, plantation, public administration, defense and compulsory social security services. Among these establishments, 44.07 million (75.33%) were engaged in non-agricultural activities, where the non-agricultural activities are adjusted by excluding the units engaged in mining and quarrying, electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and remediation activities and construction so that the figures become comparable with the ESs conducted for non-agricultural enterprises (excluding construction). Out of which, 49.99% establishments are in the rural areas and 50.01% in the urban areas. Among the non-agricultural establishments, 29.32 million (66.54%) are own account establishments (OAE), out of which, 55.16% and 44.84% are in rural and urban areas respectively. The remaining 14.75 million (33.46%) are estt., out of which, 39.69% and 60.31% establishments are in rural and urban areas respectively.

[2] The enterprise assisted by one or more hired workers on a fairly regular basis (irrespective of whether it functioned without any hired worker during the reference month or not) is considered as establishment and it's different concept of a production unit located at a single location as defined in various NSS.

On the other hand, NSS 67th round (2010-11) estimates total 57.67 million enterprises at all-India level. Out of the total number of enterprises 53.56% are in rural areas and the remaining 46.44% are in urban areas. As per the results obtained from the survey, the OAEs had a dominant share in the unincorporated non-agricultural enterprises (excluding construction). At all India level 84.63% of the estimated number of enterprises under coverage is OAEs. The share of OAEs is 57.87% in the rural areas and 42.13 % in the urban areas whereas in case of estt. (15.83% of total estimated enterprises) the shares of rural and urban sectors are 29.84% and 70.16% respectively. NSS 73rd round (2015-16) provides an estimate of 63.39 million enterprises (adjusted for 'non-captive electricity generation and transmission') at all-India level. The distribution of enterprises into Sectors and type of establishment are more or less same as NSS 67th round.

Since the year of operation for 6th EC lies in between the reference periods of NSS 67th and 73rd rounds, to get more comparable estimates the average number of enterprises is computed from the estimates produced by two enterprise surveys. As per the average estimate of NSS 67th and 73rd round, there are total 60.53 million enterprises at all-India level. Out of which, 52.35% in rural areas and 47.65% in urban areas; 84.39% are OAEs and rest 15.61% are at least one hired worker. Comparing with average estimates 6th EC has under listed total number of non-agriculture establishments to the extent of 27% at aggregate level. In case of rural and urban the level of under listing is 30% and 24%.

Most importantly, the comparison reveals that in case of OAEs the level of under listing is 43% whereas in case of estt. the 6th EC enumerates about 56% more establishments than the average value of NSS two rounds devoted for ES. Same pattern of under and over listing of total number of establishments has been observed in rural and urban areas for OAEs and estt.

Table-1: Total No. of establishments ('000) enumerated by EC and estimated number of enterprises by enterprise surveys by sector and type of establishment

Source	Rural			Urban			Combined		
	Without Hired Worker	With at Least One Hired Worker	Total	Without Hired Worker	With at Least One Hired Worker	Total	Without Hired Worker	With at Least One Hired Worker	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
6th EC (2013-14)	27564	7232	34796	14400	9299	23700	41964	16531	58495
6th EC (non-agriculture)	16174	5853	22027	13147	8894	22040	29320	14747	44067
NSS 67th round (2010-11)	28246	2645	30891	20564	6218	26782	48810	8863	57673
NSS 73rd round (2015-16)	29693	2794	32487	23663	7238	30902	53356	10032	63389

Source	Rural			Urban			Combined		
	Without Hired Worker	With at Least One Hired Worker	Total	Without Hired Worker	With at Least One Hired Worker	Total	Without Hired Worker	With at Least One Hired Worker	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
average of NSS 73rd and 67th round	28970	2719	31689	22114	6728	28842	51083	9447	60531
% of under listing	44	-115	30	41	-32	24	43	-56	27

*Non-agriculture estimates are adjusted for the electricity.

Total number of establishments as enumerated by 6th EC and estimated number of enterprises by NSS 67th and 73rd rounds for rural, urban and at-all India level are shown in figure-1. It is clear from this figure that the number of enumerated establishments in sixth EC are very less than the estimated enterprises given by two NSS enterprises surveys. Moreover, it is less than the average number of enterprises estimated by two ESs.

Figure-1: Total number of establishments ('00000) by 6th EC, NSS 67th round, NSS 73rd round and average of NSS 67th& 73rd rounds

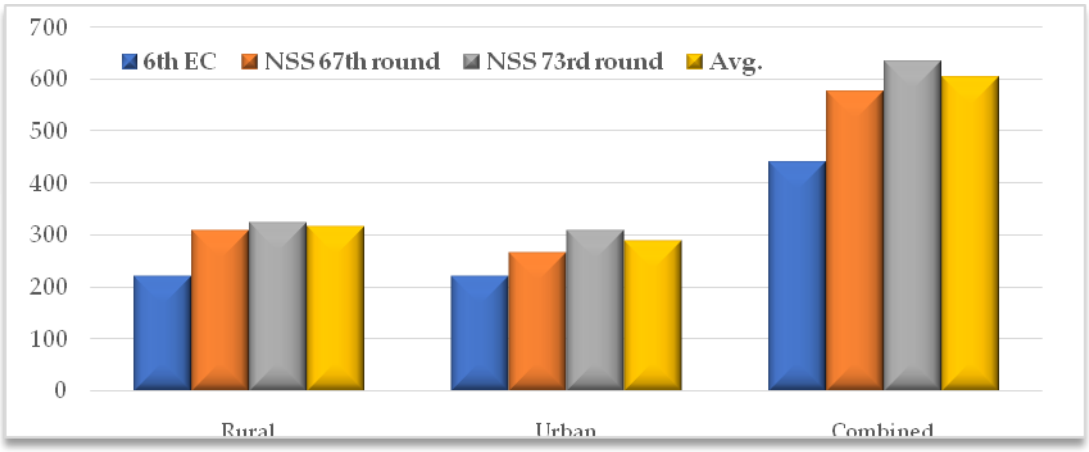


Figure-2 plots total number of establishments as listed by 6th EC, the number of enterprises estimated by NSS 67th& 73rd rounds and the average number of enterprises estimated by two ESs for 14 States namely Punjab, Rajasthan, Uttar Pradesh, Bihar, West Bengal, Jharkhand, Odisha, Madhya Pradesh, Gujrat, Maharashtra, Karnataka, Kerala, Tamil Nadu and Andhra Pradesh having a share of 90% to the total counts in EC. Except Kerala, for all other 13 States EC under lists the number of establishments as compared to average of the two ESs.

Figure-2: State wise total number of establishments ('00000) by 6th EC, NSS 67th round, NSS 73rd round and average of NSS 67th & 73rd rounds

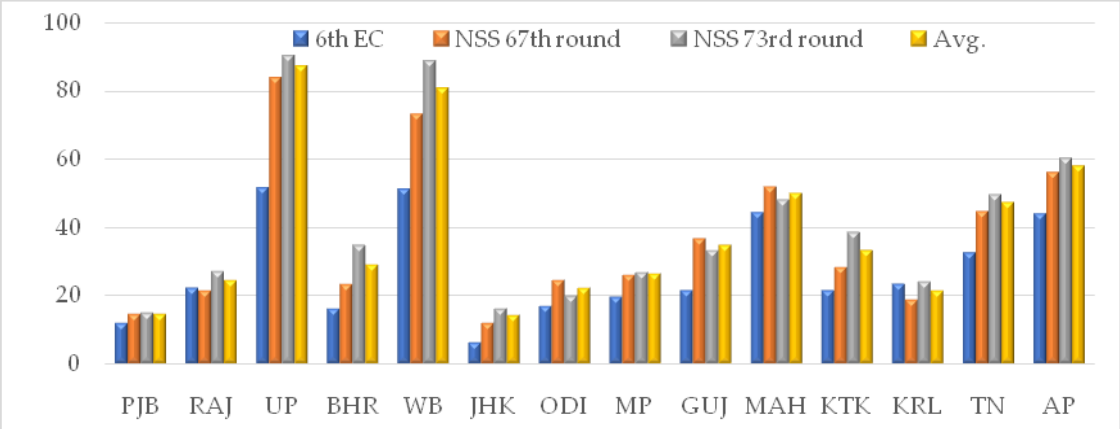


Table-2 presents State/UT wise percentage of under listing of adjusted non-agricultural establishments in 6th EC compared to the average estimates of the two ESs. Except for Kerala for all larger States (with more or less 2% share in total) the EC catalogues total establishments much on lower side for both rural and urban areas. For the smaller States with less than 2% share in total particularly for North-eastern States and UTs the EC enumerates establishments overly than average number of estimated enterprises. Except few NE States for most of the States EC reports lesser establishments in case of OAEs whereas for majority of States/UTs the EC counts more estt. than the average.

Table-2: State/UT wise Percentage of under Listing in Total Number of Establishments: Comparison between 6th EC and Avg. of NSS 67th and 73rd Rounds

State	Rural			Urban			Combined		
	OAE	estt.	Total	OAE	estt.	Total	OAE	estt.	Total
J & K	36	-71	21	46	-2	35	40	-30	27
HP	15	-81	1	1	-6	-1	13	-56	1
Punjab	31	-90	14	36	-21	21	34	-39	19
Chandigarh	63	43	58	-1	-35	-10	4	-31	-5
Uttarakhand	39	-46	26	26	-5	17	34	-22	22
Haryana	14	-63	4	35	-24	19	26	-34	13
Delhi	45	29	41	22	13	18	22	13	18
Rajasthan	22	-246	-3	39	-61	19	30	-118	8
UP	53	-89	43	52	-26	38	52	-46	41
Bihar	61	-142	47	50	-18	36	58	-74	44
Sikkim	20	-269	-7	-22	-65	-31	3	-140	-17
Arunachal	0	-536	-73	-37	-66	-48	-15	-198	-60
Nagaland	5	-160	-18	27	1	18	16	-38	2
Manipur	-9	-251	-22	-12	-85	-21	-10	-151	-22
Mizoram	-8	-668	-71	-34	-129	-58	-23	-225	-62

State	Rural			Urban			Combined		
	OAE	**estt.**	**Total**	**OAE**	**estt.**	**Total**	**OAE**	**estt.**	**Total**
Tripura	52	8	47	-13	-65	-23	38	-16	31
Meghalaya	46	-70	19	-2	-56	-21	35	-65	9
Assam	-9	-154	-29	-72	-89	-77	-22	-124	-41
WB	52	-34	47	29	-23	19	45	-27	37
Jharkhand	83	-89	69	50	-107	19	76	-97	57
Odisha	44	-158	30	23	-56	6	40	-111	25
Chhattisgarh	55	-274	34	32	-10	20	47	-76	28
MP	49	-242	30	42	-58	23	46	-108	27
Gujarat	52	-208	29	64	-56	43	60	-80	39
Daman & Diu	62	17	48	-6	-233	-56	17	-120	-18
D & N Haveli	73	-71	50	6	-93	-39	52	-86	13
Maharashtra	27	-180	11	31	-41	11	29	-64	11
Karnataka	48	-118	35	49	4	36	48	-19	35
Goa	-21	-55	-29	-52	-45	-49	-39	-48	-42
Lakshadweep	39	-147	3	-79	-134	-98	-32	-137	-62
Kerala	12	-27	4	-11	-50	-22	2	-40	-9
TN	50	-93	31	53	-27	32	52	-41	32
Puducherry	23	-96	-3	56	12	43	50	-1	35
A&N	12	-295	-27	40	-33	17	26	-98	-3
AP+Telangana	38	-176	23	47	-60	26	42	-97	24
Total	**44**	**-115**	**30**	**41**	**-32**	**24**	**43**	**-56**	**27**

Table-3 gives percentage of under listing of number of establishments as enumerated by 6th EC compared to the average of 67th and 73rd round estimates by sector and enterprise type (based on number of hired workers) for 15 different broad activity categories involved in non-agricultural activities. At national level the 6th EC has under listed the non-agricultural and adjusted non-agricultural establishments to the extent of 25% and 27% respectively. EC reports more than 40% under listing for 4 activity categories (manufacturing, other whole sale trade, transportation & storage and financial & insurance activities) whereas for education it over lists number of establishments by 69%. For rural EC enumerates the number of establishments much at lower side for 11 broad activity categories where for rest it enumerates at on upper side. For urban sector it counts the number of establishments on upper side only for one category i.e., financial and insurance activities while for remaining it over counts. In case of OAEs it catalogues the non-agricultural underneath to the extent of maximum 70% (financial and insurance activities) and minimum 22% (whole sale trade, retail trade & repair of motor vehicles & motor cycles) whereas in case of most of estt. it enumerates establishments overly with level of maximum 455% (financial and insurance activities) and minimum 10% (manufacturing) with the exception that only for two categories viz. other whole sale trade an administrative & support service activities it reports under listing. The same picture of under and over enumeration of OAEs and estt. has been observed in rural and

urban areas. In absence of any uniform pattern of under listing for different categories no comparison can be made between rural and urban areas.

Table-3: Percentage of under Listing of Non-Agricultural Enterprises in 6th EC as Compared to the Average of NSS 67th and 73rd Round Estimates

Broad Activity Category	Rural			Urban			Combined		
	With Out Hired Worker	With At Least One Hired Worker	Total	With Out Hired Worker	With At Least One Hired Worker	Total	With Out Hired Worker	With at Least One Hired Worker	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Manufacturing	55	-12	49	51	-10	36	54	-10	44
Whole sale trade, retail trade & repair of motor vehicles & motor cycles	-3	-30	-11	34	-21	10	22	-23	4
Other whole sale trade	41	-7	33	61	39	50	53	32	45
Other retail trade	30	-154	22	28	-69	10	29	-87	16
Transportation and storage	52	17	48	50	-67	40	51	-12	44
Accommodation and Food service activities	34	-61	20	34	-17	17	34	-30	18
Information & communication	59	-162	32	40	-51	12	48	-72	19
Financial and insurance activities	77	-823	66	39	-345	-16	70	-455	47
Real estate activities	55	-65	50	34	-52	25	40	-54	32
Professional, scientific & technical activities	23	-187	-8	42	-20	21	37	-41	14

Broad Activity Category	Rural			Urban			Combined		
	With Out Hired Worker	With At Least One Hired Worker	Total	With Out Hired Worker	With At Least One Hired Worker	Total	With Out Hired Worker	With at Least One Hired Worker	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Administrative and support service activities	19	2	14	40	4	25	30	3	20
Education	56	-694	-209	53	-41	20	54	-294	-69
Human health & social work activities	46	-427	-6	39	-11	15	43	-79	5
Arts entertainment, sports & amusement and recreation	45	-69	20	43	-29	23	44	-46	21
Other service activities not elsewhere classified	40	-597	15	44	-83	25	42	-192	20
Non-Agricultural Activities	43	-124	28	39	-36	21	41	-61	25
Adj non-agriculture	44	-115	30	41	-32	24	43	-56	27

Since the estimates obtained from the NSS 67th and 73rd rounds are based on samples, they are subject to varying levels of sampling error. Before making these figures ready for comparison with other source it is important to look into the precision of these estimates. Relative Standard Errors (RSEs) of estimated average number of unincorporated nonagricultural enterprises obtained from NSS 67th and 73rd rounds categorized by broad activity and sector at all-India level are given in table 4 to show the reliability of estimates. At aggregated level RSEs for estimated number of non-agricultural enterprises for type of enterprises in both rural and urban sectors are less than 5% indicating higher precision of producing estimates. Further for each broad activity category RSE is still less than 5% at all-India level.

Table-4: RSE (%) of Estimated Number of Enterprises for Different Broad Activity Categories

Broad Activity Category	Rural			Urban			Combined		
	With Out Hired Worker	With at Least One Hired Worker	Total	With Out Hired Worker	With at Least One Hired Worker	Total	With Out Hired Worker	With at Least One Hired Worker	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Manufacturing	1.96	2.17	1.84	3.45	2.74	2.91	1.83	1.96	1.66
Whole sale trade, retail trade & repair of motor vehicles & motor cycles	5.30	5.03	4.17	7.03	4.81	5.41	5.07	3.99	4.11
Other whole sale trade	5.33	6.29	4.60	5.71	7.35	4.92	3.90	6.37	3.65
Other retail trade	1.52	3.16	1.50	2.97	3.59	2.96	1.57	2.88	1.63
Transportation and storage	2.90	3.79	2.74	3.42	4.64	3.26	2.21	2.79	2.08
Accommodation and Food service activities	2.76	3.05	2.43	3.27	2.69	2.59	2.24	2.10	1.87
Information & communication	8.16	8.11	6.80	6.46	5.23	4.78	5.17	4.49	3.98
Financial and insurance activities	3.33	13.04	3.29	5.72	8.09	5.17	2.96	6.12	2.85
Real estate activities	7.99	10.23	7.70	4.64	6.99	4.31	4.20	6.24	3.94
Professional, scientific & technical activities	7.56	7.68	6.59	5.54	8.80	4.81	4.29	7.77	3.85
Administrative and support service activities	5.85	4.93	4.50	7.84	7.45	6.43	5.16	5.13	4.25

Broad Activity Category	Rural			Urban			Combined		
	With Out Hired Worker	With at Least One Hired Worker	Total	With Out Hired Worker	With at Least One Hired Worker	Total	With Out Hired Worker	With at Least One Hired Worker	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Education	6.32	3.83	4.36	3.99	2.61	2.87	3.46	2.20	2.43
Human health & social work activities	4.21	5.94	3.83	4.22	3.63	3.14	3.03	3.21	2.51
Arts entertainment, sports & amusement and recreation	8.18	10.51	6.73	7.02	7.44	5.49	5.32	6.35	4.26
Other service activities not elsewhere classified	2.27	3.96	2.18	2.86	3.48	2.69	1.85	2.92	1.78
Adj. non-agriculture	1.26	1.55	1.22	2.09	2.19	1.93	1.19	1.63	1.15

RSEs are also computed for different sectors and type of establishment at State/UT level individually. The results show less than 5% RSE for J&K, HP, Punjab, Uttarakhand, Rajasthan, UP, Assam, WB, MP, Maharashtra, Karnataka, Kerala, TN and AP. For 3 NE States like Arunachal Pradesh, Nagaland and Tripura and 5 UTs like Chandigarh, Daman & Diu, Dadra and Nagar Haveli, Goa, Puducherry the RSE is more than 10%. For 24 States/UTs the RSE of estimated number of enterprises is higher in rural areas than urban areas. The estimates for OAEs have lower RSE than the estt. for most of the States.

Table-5: State wise RSE (%) of Estimated Number of Enterprises

State/UT	Rural	Urban	OAE	estt.	Total
(1)	(2)	(3)	(4)	(5)	(6)
J&K	10.03	6.94	6.54	7.73	4.46
HP	6.70	15.20	6.10	9.01	4.26
Punjab	6.93	7.07	6.07	7.26	3.85
Chandigarh	12.71	30.64	27.00	34.91	20.31
Uttarakhand	7.11	11.34	7.15	10.31	4.60

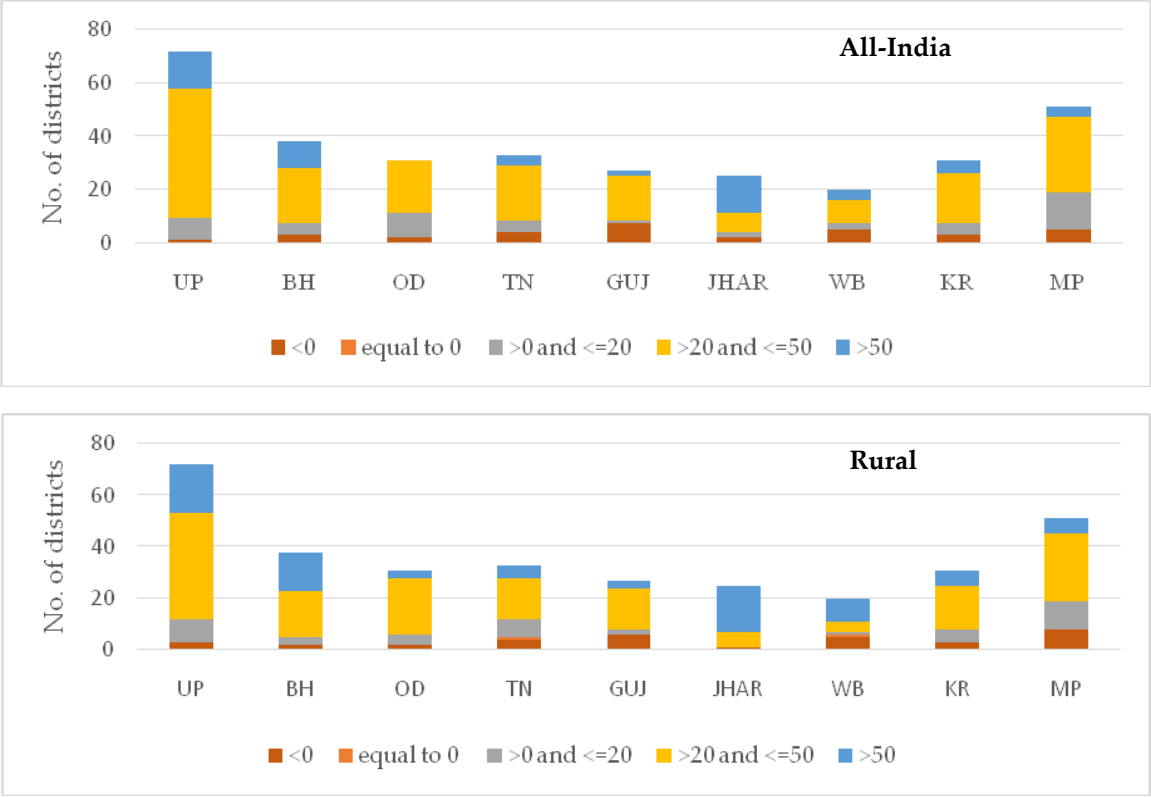
State/UT	Rural	Urban	OAE	estt.	Total
(1)	(2)	(3)	(4)	(5)	(6)
Haryana	6.81	16.10	11.41	7.77	6.99
Delhi	14.58	8.32	9.33	9.11	5.81
Rajasthan	5.38	9.92	6.08	5.52	3.84
UP	3.82	12.99	5.49	11.91	4.24
Bihar	6.38	21.84	7.91	14.51	5.71
Sikkim	11.14	19.89	13.96	13.65	8.82
Arunachal	9.10	30.70	14.82	24.86	11.26
Nagaland	9.35	35.28	16.32	35.82	14.55
Manipur	12.18	13.93	9.32	15.53	6.21
Mizoram	5.67	14.44	9.26	12.47	6.28
Tripura	69.55	7.97	53.75	52.84	37.84
Meghalaya	15.55	11.72	13.84	13.38	8.67
Assam	7.99	11.03	6.87	10.19	4.68
WB	6.37	6.05	5.13	5.83	3.45
Jharkhand	10.74	6.99	8.85	9.56	5.94
Odisha	5.64	7.88	4.47	6.50	2.97
Chhattisgarh	14.97	8.89	11.41	12.08	7.11
MP	5.00	4.63	3.48	8.09	2.44
Gujarat	6.14	14.60	11.47	12.55	7.55
Daman & Diu	18.71	24.23	19.77	18.44	13.53
D&N Haveli	28.30	45.13	26.71	46.69	21.77
Maharashtra	6.12	5.64	4.33	6.76	2.99
Karnataka	4.91	6.96	4.35	9.67	3.14
Goa	16.09	19.34	17.22	18.99	10.96
Lakshadweep	17.11	15.18	11.64	26.66	8.87
Kerala	4.63	6.81	4.42	7.24	3.02
TN	4.13	6.84	4.67	6.62	3.34
Puducherry	25.38	35.28	28.95	40.11	22.60
A&N	13.29	9.40	11.47	6.30	6.84
AP+Telangana	3.36	8.02	4.13	6.22	2.78
Total	**1.22**	**1.93**	**1.19**	**1.63**	**1.15**

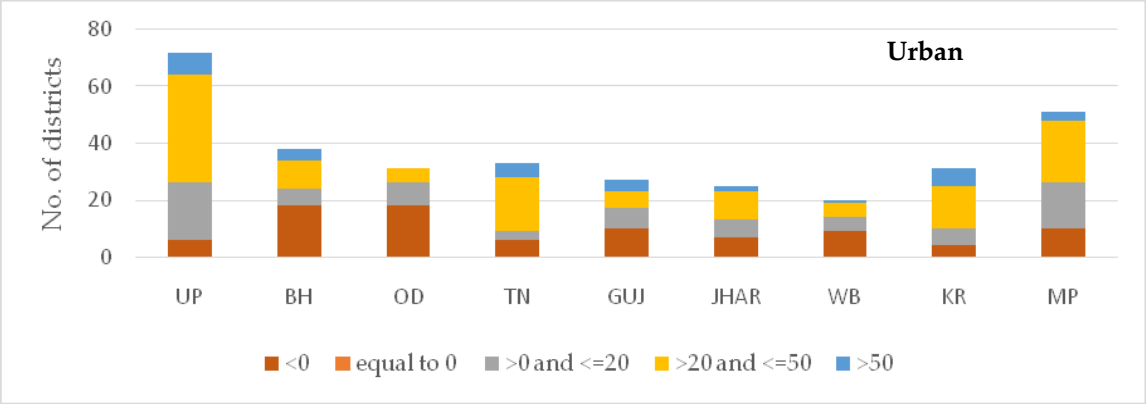
5. Pattern of Divergence Across all Districts within the State

The pattern of divergence in the estimated number of enterprises may be seen at district level for a few larger States namely, Andhra Pradesh, Bihar, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Odisha, Tamil Nadu, Uttar Pradesh and West Bengal (with equal to 2% or more than 2% share in total) having greater than and equal to 20%

mismatch between two sources viz. EC and ESs. Figure 3 shows the district wise percentage of under listing of number of enterprises for the above-mentioned States except Andhra Pradesh because the State boundaries were altered in the year 2014and bifurcated into two States. The districts of all States are divided into 5bins (less than 0, equal to 0, more than 0 but less than and equal to 20, more than 20 but less than and equal to 50 and more than 50) as per the level of under listing. It is seen that in all larger States, there is more than 20% under listing for most of the districts. The analysis has been done for the rural and urban sector separately. In the rural sector the pattern of under listing just overlaps with the all-India pattern whereas in urban sector the picture is little different. In the urban sector the number of districts for which EC lists more enterprises over the average of NSS 67th and 73rd rounds are more compared to the all-India and rural sector.

Figure 3: District wise percentage of under listing





6. Conclusions

The objective of the present study is to analyze the validity of EC results. Despite the checking and validation done before publishing the results, there is a clear indication of under listing of number of establishments enumerated by 6th EC compared to the estimates produced by NSS conducted on unincorporated non-agricultural enterprises at all-India as well as State level. Comparison has been made with the average estimated number of non-agricultural enterprises (adjusted for non-captive electricity generation) obtained from the NSS 67th and 73rd rounds. In detail, for OAEs EC under lists number of establishments whereas for the estt. EC lists the establishments overly. No such implicit conclusion can be made in case of rural and urban areas. But for most of the cases the percentage of under listing is higher for rural areas compared to urban. For the larger States (in terms of higher share in the total listed establishments) EC lists down establishments much on lower side. The reliability of estimates generated by last two ESs has been checked so that the estimates produced by these two surveys can be used as an external information to check the quality of EC results. At all-India level the RSE is less than 5% in both rural & urban areas as well as for OEAs and estt. indicating higher accuracy of NSS estimates. Moreover, except for the smaller States having less sample size the State wise RSE for rural & urban and OAEs & estt. is less than 5% which further means at State level the estimates provided by enterprise surveys are reliable enough for making comparison with results of EC. For different broad activity categories, at aggregated level the RSE is less than 5% and at segregated levels like rural & urban, OAEs & estt. the RSE is less than 10%, except few. It means that the NSS estimates are quite reliable for comparing the EC results. Comparison has also been made at district level for a few larger States with high level of divergence in the number of enterprises between the two sources. It has been found that in all such States, for most of the districts the level of under listing is very high i.e., more than 20%. Thus, to summarize, the validity of results produced by EC should be checked further so that in future censuses the problem of under listing can be addressed effectively.

7. Limitations

The finding of this study may be seen in light of the following limitations:

(i) Like any census operation the results of EC are also subject to some extent of non-sampling error. Collection of information in EC is not generally record-based but based on oral information. Because of this, the factors like recall lapse and casual approach on part of informations may lead to some non-sampling errors.

(ii) For the purpose of comparison of number of enterprises as per the sixth EC (January 2012-April 2014) with the NSS, average figure of NSS 67th round (July 2010-June 2011) and NSS 73rd round (July 2015-June 2016) has been considered. In other words, an assumption of linearity in the trend in number of enterprises between 2010-11 and 2015-16 has been assumed which might not be a reality. Further, the comparison is partly affected in view of the difference in time between the period of sixth EC and the mid-point of the two NSS rounds under reference.

Acknowledgment

The author is grateful for the valuable suggestions and the constructive comments given by Shri. G. C. Manna, Ex-DG, NSSO and Ms. Harshita Rai, Assistant Director, ESD, NSO. The author is also thankful to anonymous referee(s) and the Chairman and other members of Editorial Advisory Board of this journal for the thorough and thoughtful suggestions provided at various levels for revision of this paper.

References

1. NSS 67th round (July 2010-June 2011): Operational Characteristics of Unincorporated Non-Agricultural Enterprises (Excluding Construction) in India, NSSO, Ministry of Statistics and Programme Implementation.
2. NSS 67th round (July 2010-June 2011): Economic Characteristics of Unincorporated Non-Agricultural Enterprises (Excluding Construction) in India, NSSO, Ministry of Statistics and Programme Implementation.
3. NSS 73rd round (July 2015-June 2016): Operational Characteristics of Unincorporated Non-Agricultural Enterprises (Excluding Construction) in India, NSSO, Ministry of Statistics and Programme Implementation.
4. NSS 73rd round (July 2015-June 2016): Economic Characteristics of Unincorporated Non-Agricultural Enterprises (Excluding Construction) in India, NSSO, Ministry of Statistics and Programme Implementation.
5. 6th EC: All India Report of Sixth Economic Census, Ministry of Statistics and Programme Implementation.

Appendix

1. The average estimated number of enterprises based on two ES viz. NSS 67th and 73rd round estimates for activity category/sector/enterprise type/State/district is computed by using the following formula

$$\hat{Y} = \frac{\hat{Y}_1 + \hat{Y}_2}{2}$$

where $\hat{Y}_1$ and $\hat{Y}_2$ are the total number of enterprises estimated by NSS 67th round and 73rd round respectively for that particular activity category/sector/enterprise type/State/district.

2. Relative Standard Error (RSE) of the average estimated number of enterprises is calculated as

$$RSE\left(\hat{Y}\right) = \frac{\sqrt{Var(\hat{Y})}}{\hat{Y}} \times 100$$

where $Var(\hat{Y})$ is the variance of the average estimated number of enterprises obtained from two enterprises surveys using the formula as shown below:

$$Var(\hat{Y}) = \frac{1}{4}\left(\widehat{Var}(\hat{Y}_1) + \widehat{Var}(\hat{Y}_2)\right)$$

where $\widehat{Var}(\hat{Y}_1)$ and $\widehat{Var}(\hat{Y}_2)$ are the estimated sampling variances of the estimated number of enterprises computed by following the estimation procedure as given in NSS reports. Moreover, the covariance between the two estimates is zero since the estimates are evaluated from two independent surveys.

3. **Assumption of population**:

i) The estimate computed for the mid-year i.e. July, 2012-June, 2013 is a simple linear function of the available estimates as obtained from NSS 67th (July 2010 – June 2011) and 73rd (July 2015- June 2016) round.

ii) Necessary safeguards are taken by NSO to control non-sampling errors both for EC and ES so that overall quality of data as per the two sources is at par, which is a pre-requisite for the study.

iii) With regard to the concepts and definition followed, the results of EC are broadly comparable with corresponding estimates derived from ESs.

---

[i] **Coverage of NSS 67th and 73rd round**:
The survey of unincorporated non-agricultural enterprises (excluding construction) of NSS 73rd round was planned as a repeat survey of the survey on same topic conducted

during NSS 67th round (July 2010- June 2011). However, the Working Group of NSS 73rd round, while deciding the coverage of the survey suggested the following changes:

- Activities related to Non captive electric power generation, transmission and distribution by units not registered with the Central Electricity Authority (CEA) under NIC 2008 codes 35103, 35105, 35106, 35107, 35109, which were not covered in NSS 67th round are included in the coverage of NSS 73rd round. It was observed by the Working Group that this activity, which was not covered in previous NSS enterprise surveys and no alternative data source was available, needs to be brought into the coverage of NSS 73rd round.
- Two additional special codes, namely, 64193: Chit funds and 64921: Investment club are introduced under NIC 2008 Div. 64: Financial service activities other than insurance and pension funding. These special codes were introduced to capture detailed information on some important financial activities which were understood to have a sizable presence in the unincorporated sector.
- NIC 2008 Div. 65: Insurance, reinsurance and pension funding, except compulsory social security and NIC 2008 code 6622: Activities of insurance agents is excluded from the coverage of NSS 73rd round: Since Insurance Sector In the country is only present in the incorporated sector, the inclusion of this activity did not carry much meaning, which was also clear from the analysis of data of NSS 67th round. Further, data on activities of insurance agents is available from Insurance Regulatory and Development Authority of India (IRDAI).

Role of the Indian System of Medicine and Homeopathy in Treating Communicable and Non-Communicable Diseases in India

Chander Shekhar[1] and Rajaram Yadav[2]

Abstract

Historically India has been involved and remains a leader in developing plants and natural products-based medicines for human ailments. This article aimed at examining the usage of the Indian system of medicine and homeopathy (ISM & H) in treating communicable diseases (CDs) and non-communicable diseases (NCDs) in India. It provides a comparison of the utilization of ISM&H with the allopathy across sociodemographic backgrounds and sources of care by CDs and NCDs. The National Sample Survey (NSS), 71st round (2014) dataset was analyzed to reach the objectives of this paper. In general, the usage of ISM & H was relatively higher for treating NCDs than CDs; however, allopathy remains the dominant method for treating both. The adjusted odds ratio for using ISM & H treatment was 1.4 times higher for the former than for the latter group of diseases. The odds of using ISM & H treatment increases significantly with an increase in the education level of respondents to overcome the data limitation in assessing the population-level effects of ISM & H, this article proposes a question be asked in the next NSS round of social consumption is "Which kind of treatment do you think mainly responsible for curing or ameliorating the condition of your disease?".

Key Words: Indian System of Medicine, Communicable, Non-communicable, Diseases, India.

JEL Code: I1

Date of Receipt of Final Version of Paper from Author: April, 2022

Date of Acceptance: April, 2022

[1] Professor, Department of Fertility and Social Demography, International Institute for Population Sciences, Mumbai.

[2] Project Scientist, RMRC, Indian Council of Medical Research, Gorakhpur, Uttar Pradesh.

1. Introduction

Despite the invention of synthetic chemistry, natural products are essential in providing medical treatment. In some cases, such as antimicrobial and anti-tumor drugs, about 60 percent of the medicines are derived from natural products, mainly from higher plants (Calixto, 2000). India has a well-established knowledge and practice of traditional herbal medicines (Kamboj, 2000). Medicinal herbs are used in different forms under local systems of medicine like Siddha, Ayurveda, and Unani. According to an estimate from the World Health Organisation (WHO), about 80 percent of the people residing in developing countries rely on traditional medicines. It is estimated that more than 6,000 plants are currently being used in India as traditional herbal and folk medicines (Dubey et al., 2004; Mukharjee, 2002). Since India has been traditionally involved in these medicines, it needs to increase its share in the world market. At the world level, high-quality plant-based medicines will provide effective and safe medication and people who are engaged therein will have full knowledge of the production and utilization of herbal products. The Department of AYUSH has drafted an amendment to the drugs and cosmetics act, 1945, in the Gazette of India. The draft intends to monitor the certificate of good manufacturing practices given to manufacturers who follow Ayurveda, Unani, or Siddha drugs as described in Schedule T (Mukherjee et al., 2007).

Heavy metal content is a serious problem with India's traditional remedies, which are currently prevalent in Australia, the USA, Europe, and other countries. Due to unsatisfactory cultivation and agricultural practices related to the medicinal plants used in the preparation of Ayurveda, Unani, or Siddha, and due to environmental pollution, the presence of heavy metals above the prescribed limit in the preparation of herbal medicines cannot be neglected (Ramachandran, 2006).

1.1 A Brief Description of Different Systems of Medicines

Systems of Medicines*:* The term is used for recognized systems of medicine in India that are used for curative and/or preventive purposes such as Unani, Ayurveda, Yoga and Naturopathy, Allopathy, and Homeopathy. These are regulated by the Department of AYUSH and the Ministry of Health and Family Welfare as and when needed.

1.1.1 Allopathy

It is a broad category of medical practice, which is sometimes called evidence-based medicine, western medicine, biomedicine, or modern medicine. Med Terms Dictionary defines allopathy as "the system of medical practice which treats diseases by the use of remedies which produce effects different from those produced by the disease under treatment."

1.1.2 Indian Systems of Medicines

This system of medicine includes Siddha, Ayurveda, Unani, Sowa-Rig-Pa medicines and herbal medicines (*jadi-butiyan* or *desi dawa*). In India, these medicines are also called *Desi Dawaiyan*. The practitioners of these systems of medicine are called Vaidyaji, Siddha vaidya, vaidhya, hakim, hakimji, *jadi-buti* wale, etc. This system of medicine also includes *Gharelu nuskhe* (home-made remedies). A few examples of these types of medicines are ─ *Tulsi leaves* (Holy basil) for common cold, *Neem leaves (*Azadirachta indica*)* for skin diseases, *Haldi* (turmeric) for injuries and fracture, *Lahsun* (Garlic) for gathiya/joint pain, *Adarak* (Ginger) for cough, cold, throat problem, *Kalimirch* (black pepper) and *Madhu* (honey) for dry and productive cough, *Ashwagandha* (Withania somnifera), *Chyawanprash* (nutritive jam) as a tonic for energy, *Saunf* (anise) for indigestion, *Gulab jal* (Rose extracts) for eye problems and as face wash, *Ajowain* (carom seeds) and *hing* (bitter resin) for stomach pain, *Methi seeds* (Fenugreek), *Pudina (Mint leaves)*, *Laung* (clove), *Jeera* (Cumin), *Sunthy* (dry ginger) and *Trifala* for problems like loss of appetite, indigestion, constipation, *Laung* (clove) oil for toothache, *Bael powder (*Aegle marmelos*)* for diarrhea and many others. This system of medicine includes Siddha, Ayurveda, Unani, Sowa-Rig-Pa medicines, and herbal medicines (Jadi-butiyan or desi dawa). In India, these medicines are also called Desi Dawaiyan. The practitioners of these systems of medicine are called Vaidyaji, Siddha Vaidya, vaidhya, hakim, hakimji, jadi-buti wale, etc. This system of medicine also includes Gharelu nuskhe (home-made remedies). A few examples of these types of medicines are ─ Tulsi leaves (Holy basil) for the common cold, Neem leaves (Azadirachta indica) for skin diseases, Haldi (turmeric) for injuries and fracture, Lahsun (Garlic) for gathiya/joint pain, Adarak (Ginger) for cough, cold, throat problem, Kalimirch (black pepper) and Madhu (honey) for dry and productive cough, Ashwagandha (Withania somnifera), Chyawanprash (nutritive jam) as a tonic for energy, Saunf (anise) for indigestion, Gulab jal (Rose extracts) for eye problems and as face wash, Ajowain (carom seeds) and hing (bitter resin) for stomach pain, Methi seeds (Fenugreek), Pudina (Mint leaves), Laung (clove), Jeera (Cumin), Sunthy (dry ginger) and Trifala for problems like loss of appetite, indigestion, constipation, Laung (clove) oil for toothache, Bael powder (Aegle marmelos) for diarrhea and many others.

Ayurveda: Desi (indigenous) medicines prescribed by Vaidya/Vaidyaji are known as Ayurvedic medicines. It is a classical system of medicine that originated from Vedas nearly 5,000 years ago in India and is still used and prescribed in India and many other subcontinent countries. The system gives importance to curative, preventive, and promotive aspects. For therapeutic uses, plants are used along with some minerals and metals in processed forms. Some examples of Ayurvedic medicines are Kadha (extracts in hot water) of Tulsi (Holy basil), Adarak (ginger), Kalimirch (black pepper) for cough and cold, Chirayata (swertia) and juice of aloevera leaves for fever, Isabgol (Psyllium husk), harde (terminalia chebula),

Gulkand (sweet preserve of rose petals) for constipation, Ashokarishta (Ayurvedic tonic), and Dashmularisht (health tonic) for gynaecological problems, stri-rog and many others.

Currently, studies are being done on several medicinal plants used in ISM & H to establish it as a scientific system of medicine. The Central Drug Research Institute performed a series of studies in the drug screening program. Several books have been published providing information on the pharmacological and medical profile of medicinal plants. Three volumes of Ayurvedic pharmacopeia have been published so far. A series of books have been published by the Central Council for Research in Ayurvedic Sciences (CCRAS) under its database preparation project.

Siddha: It is an ancient system of medicine primarily prevalent in south India. The word Siddha is a Tamil word that means perfection. Like Ayurveda, this system also favours the use of plants along with minerals and metals in the processed form.

Unani: These are desi medicines that Hakims prescribe. This system originated in Greece and is based on the learning of Hippocrates and was developed by Arabs. Arabs helped introduce Unani medicines in India in 1350 AD. The first recognized hakim was Zia Mohd Masood Rasheed Zangi. Some of the famous physicians who were helpful in developing this system of medicine were Akbar Mohd Akbar Arzani (around 1721 AD), who wrote the books Qarabadeen-e-Qadri and Tibb-e-Akbar; Hakim M. Shareef Khan (1725-1807), who is well known for his book Ilaj ul Amraz; and Hakim Ajmal Khan (1864-1927) a renowned among the 20^{th} century Unani physicians in India. Hakim Ajmal Khan played a pivotal role in the establishment of the Unani and Ayurvedic College in Delhi. The first institution of Unani medicines was established in 1872 in Lahore in undivided India and named Oriental College. After independence, many institutions were established, and Unani got a boost from Government through many agencies involved in developing the Indian Systems of Medicine. Now there are around 30 colleges offering degree courses in Unani medicines. A National Institute of Unani medicines was established in Bangalore in Karnataka. The Central Council for Research in Unani Medicine (CCRUM) is the agency involved in research and development activities related to Unani medicines.

The combination made this system the best in the peer system of traditional medicines in Syria, Iraq, Egypt, Persia, China, India, and other Middle East countries. The literature on this system of medicine is mainly found in Persian, Urdu, and Arabic languages. Some popular Unani medicines are Kadha (extracts in hot water) made of Adarak (Ginger), Kalimirch (black pepper), Mulethi for cough and cold, Arak Saunf (anise extract), and Arak Ajawaian (Carom seed extract) for stomach ache, Safi (Blood purifier syrup) and chiraita (swertia) for skin problems, Arqe-Mako (a Unani distillate) and Arq-e-Kasni (a Unani distillate) for liver diseases, Habb-e-Kabid (a Unani medicine) and Jawarish-e-Jalinos (a Unani medicine) for digestive problems; Sharbat Khaksi (a Unani medicine), Giloy

(Tinospora Cordifolia), Tabasheer (composed mainly of silica and water with traces of lime and potash) for fever.

Sowa-Rig-Pa: It originated in India and is known as Amchi (superior to all) or Tibetan medicine. It is a traditional system of medicine in the Himalayan region. It has popularly been practiced in the Paddar-Pangay areas of Jammu and Kashmir, Ladakh, Darjeeling-Kalingpong, Sikkim, Arunachal Pradesh, and in the Tibetan settlements all over the world. The meaning of the word Sowa-Rig-Pa is "science of healing", and the practitioners of this medicine are called Amchi.

Homeopathy: Homeopathy was developed about 200 years ago by a German physician Dr. Samuel Hahnemann. After observing many natural phenomena, he concluded that a thing that can cause a disease-like condition could also cure a similar type of disease condition. The meaning of the word Homeopathy is “similar sufferings”, and the working of this system of medicine is mainly based on “let likes be treated by likes”. This system of medicine is administered in a very simple form, that is, even if a patient is suffering from several complications, the homeopathic physician will prescribe a single medicine at a time, which works on the patient as a whole. In this system of medicine, highly diluted doses from minerals, animal kingdom, and plants are used to stimulate natural defences in the body. These medicines are available in many forms like homeopathic pellets (balls), tablets (lactose-based), liquid dilution, and mother tincture.

Yoga and Naturopathy: *Yoga* is a combination of *Pranayam* (breathing exercises), *Asanas* (physical postures), and meditation for curing illness and releasing stress (both physical and mental). It is about the act of meeting a person’s own consciousness and the universal consciousness. Naturopathy is based on panchtatva (five elements of nature), namely (i) Earth (mud bath, mud wraps, mud packs), (ii) Water (hydrotherapy methods like baths, douches, jets, immersion, packs, compresses) (iii) Air (breathing exercises, open-air baths, outdoor walks) (iv) Fire (magnetised water, sunbath), and (v) Ether (fasting therapy).

AYUSH: Each letter of the word AYUSH represents a specific system of medicine: A-represents Ayurveda, Y-represents Yoga and Naturopathy, U-represents Unani, S-represents Siddha, and H-represents Homeopathy. Thus, AYUSH comprises Indian Systems of Medicine, Yoga and Naturopathy, and Homeopathy. Treatment by any of these systems of medicine qualifies as AYUSH treatment, and medicines used by any of them are called AYUSH medicines. In India, due to the vast geographical and cultural diversity, the same medicinal plant is known by different names under different systems of AYUSH. In other regions of the country, more than one AYUSH is in practice concurrently. Therefore, it isn't easy to allocate the exact boundaries of Siddha, Ayurveda, and Unani systems of medicine, especially when it relates to the use of plants. Due to this reason, it was decided to collect information on Siddha, Ayurveda, and Unani under a single head, namely the Indian Systems

of Medicine. All plant-based medicines used in different parts of the country are parts of the Indian System of Medicine (Siddha, Ayurveda, Unani, or Sowa-Rig-Pa).

1.2 Previous Studies on ISM & H Care Utilization and its Determinants

A multi-country study with 2400 respondents from Malaysia, Indonesia, and India shows that 24 percent of participants believed that traditional medicine (TM) is better if taken together with conventional medicines. 62 percent perceived that TM was safe due to traditional practices and natural sources. Most TM users (91%) used local herbs, and 63 percent used TM for general health and vitality. The other type of TM used were Traditional Chinese Medicine (TCM), Herbs from Malaysia, Indonesia, and India. Most respondents have gone self-use rather than through a trained provider's prescription, as 73 percent of respondents did not report their use of TM to their doctors (Nurolaini et al., 2014). Many different plant species are used to treat a wide range of acute and chronic illnesses in India (Muthu et al., 2006).

WHO estimates that in many developed countries suggests that 70~80 percent of the population has used some form of alternative or complementary medicine, including Ayurvedic, homeopathic, naturopathic, traditional oriental, and Native American Indian medicine (WHO, 2002). It is recognized that herbal medicines are the most popular form of traditional medicine and are highly lucrative in the international medical market. Annual revenues in Western Europe were estimated at US$ 5 billion in 2003-04. In China, the revenue was estimated at US$ 14 billion in 2005, and in Brazil, it was US$ 160 million in 2007 (WHO Media Centre, 2008).

Utilization was observed in a particular geographical area (states) and by a specific group of people such as the tribal and general population, medical practitioners and religious groups. Perception of the AYUSH system was mixed with different segments of the society. The general population's preference revolves around distrust or frustration with allopathic medicine, cost-effectiveness, accessibility, non-availability of other options, and fewer or no side effects of AYUSH medicines. Moreover, people primarily adopted AYUSH systems of treatment based on their personal experiences and recommended the same to other people.

In another study of a systematic review of 13 published articles in the Indian context, the utilization of ISM&H was found to be 29%. The utilization among females (49%) was more compared to males (15%). Safety (83%), compliance (68%), and affordability (53%) were a few main reasons for utilizing ISM & H (Samal and Dehury, 2019). A hospital-based study of 98 cancer patients found that most TM users patients (83.3%) in Ghana had not informed their doctors about traditional medicine use. Young, married, and highly educated individuals were more likely to use traditional medicines. The researchers used a cross-sectional analysis with a questionnaire given to cancer patients who were getting

radiotherapy or chemotherapy or had recently completed treatment at a single institution. Respondents were chosen by convenient sampling if they were 18 years of age or older, had been diagnosed with cancer, and had been referred to the National Centre for Radiotherapy and Nuclear Medicine, Korle-Bu Teaching Hospital for treatment (Yarney et al., 2013).

A stakeholder mapping study identified key policy actors, and 46 in-depth interviews with policymakers, doctors, academics, healer associations' members, and community elders in Meghalaya (India) were performed. A total of 44 interviews were done with traditional healers from the Khasi and Garo tribes. Document analysis and observations were used to supplement the interview data. Thematic content analysis with grounded theory elements was used to analyze qualitative data. The estimated usage of traditional medicine across the households of rural Meghalaya was reported at 79%, where the traditional medicine was used for both major (23%) and minor ailments (34%). Of the 79% of the users, 14% reported frequent, and 65% seldom use. Eighty-eight percent of users believed that traditional medicine is efficacious (Albert and Porter, 2015). Another study encompasses ISM & H by type of diseases and found that Ayurvedic treatment was the preferred choice for various acute health conditions like sour throat, cold and cough, gas, toothache and hair fall, and obesity in chronic health conditions. (Chatterjee et al., 2012).

Besides these books, several review articles providing names of plants used in different disease conditions have been published in many national and international journals. Suppose the problems prevailing in this system are analyzed and solved. In that case, it is clear that there will be increased acceptability and uses of ISM & H, especially those drugs based on herbal products in India and abroad. The fundamental problem that is still to be solved is proving the effectiveness of medicines used in these treatment systems based on controlled clinical trials and other experimental studies. The government of India is now considering these issues and has initiated various projects to formulate a standard methodology for proving the effectiveness of these medicines (Ravishankar and Shukla, 2007).

In the backdrop of the literature above, the paper's main objective is "to examine the change in sources of treatment and the contribution of the Indian Systems of Medicine and Homeopathy in treating the selected communicable and non-communicable diseases". This article examines the association between the use of ISM & H and sociodemographic background characteristics. This paper also shows how ISM & H's public sources of care vary across CDs and NCDs in India.

2. Data and Methods

NSS 71st round (2014) data has been used to reach the objective of the paper. In the 71st round, 3,33,104 individuals were surveyed, out of which 37,282 reported any kind of morbidity. Information on morbidity was collected for a reference period of 15 days. In

contrast, information on the event of hospitalization of a person was collected for a period of 365 days preceding the inquiry date. The number of ailments for which information was collected was 61.

The sample design adopted for the survey was a two-stage stratified design in which census villages and urban blocks were used as the first stage units (FSUs) for rural and urban areas, respectively, and households were used as the second stage units (SSUs). The rural and urban samples of FSUs were drawn independently in the form of two subsamples, and an equal number of FSUs of each subsample was allocated. The inquiry on morbidity was collected with a reference period of 15 days, whereas for hospitalized treatments, the information was collected for every event of hospitalization of a member, whether living or deceased at the time of the survey, during a period of 365 days preceding the interview date. This article considers the erstwhile status of Indian states and union territories as of 2014 when information was collected from the respondents. We have used multipliers given in the dataset, also known as weights, to generate all our estimates to make our results representative.

2.1 Definitions of Outcome and Independent Variables

Outcome variable: Level of ISM & H medicine utilization among those respondents who suffered from any self-reported disease in the seventy-first round of NSS.

Independent variables: Age, residence, family size, caste/tribe, religion, monthly per capita household expenditure (MPCE) tercile, education, marital status, occupation, type of diseases. The detail of each variable is provided in the section 2.2 (i).

To show the role of the Indian systems of medicine in treating CDs and NCDs, the percentage of use of the Indian systems of medicine and homeopathy (ISM & H) by communicable and non-communicable has been presented for each state and union territory. A multivariate logistic regression was applied to examine the association of socio-demographic factors with the use of ISM & H. To examine the role of ISM & H in treating particular NCDs, percentage use of ISM & H has been shown for diseases, namely Cardiovascular Diseases (CVDs), Injuries, Goitre, Diabetes, Blood Pressure, Mental Disease, and Cancers along with other diseases. Finally, the percentage distribution of ISM & H users by sources across other NCDs and CDs and other diseases was also analysed.

2.2 Statistical models

Multivariate Logistic Regression

Multivariate logistic regression was applied to show the usage of ISM & H as a dependent variable of dichotomous nature (1-yes for using ISM & H; otherwise 0) in the model with background characteristics.

$$\text{Logit(Y)} = \ln\left(\frac{p}{1-p}\right) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \in$$

Where, p is the probability of using ISM & H and α is an intercept, $\beta_{i's}$ are regression coefficients, $x_{i's}$ are set of predictors and ϵ is an error term.

(i) Definition of Independent Variables

Residence: as per the data availability, response for place of residence is available in two categories, i.e. rural and urban. Rural was taken as the reference category in the model.

Family size: Family size is the number of household members usually live together and we have grouped in three strata as families of 1-5 members; 6-10 members;11+ members, and '1-5 member' stratum was treated as the reference category in our logit model.

Caste/tribe: In India, people are categorized into four strata by caste or social groups, namely scheduled caste, scheduled tribe, other backward class, and others. Scheduled caste/Scheduled tribe (SC/ST) represents the lowest rung of social strata. As per articles 341 and 342 of the Constitution of India, the President of India, in consultation with the Governor of a State through public notification, may specify the castes, races or tribes or part of these groups deemed as scheduled castes and scheduled tribe respectively. Other backward classes (OBC) are identified socially and economically backward class strata as per recognition by the above system. The people other than SC/ST and OBC are grouped as 'Others'. However, the fundamental "Rights to Equality" under article 15 of the Indian constitution prohibits any discrimination against any citizen on the grounds only of religion, race, caste, sex, place of birth or any of them. SC/ST was taken as the reference category in the model.

Religion: As per the faith in any particular religion or godly power reported by the head of the sampled household is kept in three broad groups─Hindu; Muslim; Others (other than Hindu and Muslim groups together). In our logit model, Muslim was treated as the reference group.

Economic status: This article constructed MPCE terciles for measuring economic status of household at the time of survey. The first/lowest tercile of MPCE is denoted as 'Poor', the second as 'Middle' and the third/highest as 'Rich' while categorising the economic status. The remaining independent variables are defined below. The first tercile 'Poor' was considered as the reference category in the logit model.

Education: As per the education attainment reported by the respondents, all of them have been classified in four groups─Non-literate; primary; higher secondary; diploma; Graduate and above. The reference category in the model was 'Non-literate'.

Marital status: Individual respondents, based of the major social recognition of marital categories, were classified in three major subgroups─Never married (also called single); currently married (married socially or legally); widowed, divorced, and separated clubbed together for the sake of convenience. Never married by marital status was taken as the reference category in the model.

Occupation: On the basis of broad popular economic activities and frequency of occupation of respondents, we have classified all the respondents into six subgroups and these are─Self-employed in agriculture; casual labour in agricultural; self-employed in non-agricultural; regular wage/salary; casual labour in non-agriculture; Others (all remaining together). Self-employment in agriculture was taken as the reference category in the model.

Age**:** is divided in the four population subgroups based on popular criteria from the sociodemographic perspective, i.e., 0-4; 5-14; 15-59; 60+ years. These are the ages for those for whom the treatment ISM & H treatment was sought and hence not necessarily the respondent in the survey. The reference category in the model for this variable was '0-4' age group.

Type of diseases: Three broad classification of ailments or diseases reported by respondents based on International Classification of Diseases (ICD-10) was generated as communicable diseases (CDs); non-communicable diseases (NCDs); others (other than CDs and NCDs). In this paper, we followed Mahal, Karan & Engelgau (2010) for the classification of 61 ailments collected in NSS into these major types of diseases (see Appendix Table A-6). Communicable diseases were the reference category in the model.

(ii) Number of observations available for the analysis

For our logit model 37, 244 cases (number of observations) were available and used for conducting the analysis.

(iii) Inclusion and Exclusion criteria

Those respondents who have reported any kind of morbidity irrespective of sought treatment were included in the analysis. Those who have sought ISM&H treatment were coded as 1 else '0' in the dependent variable of the logit model and hence those not sought any treatment for reported morbidity were retained in the analysis.

(iv) Sample weights

In the logit regression, we have used the sample weights as multipliers were available in the dataset. This will provide equal chance probabilities for representing respondents in the respective background characteristics.

We have also used chi-square test statistics to establish whether bi-variate associations are statistically significant and given in Table-A-3 and Table-1.

3. Results

3.1 State-Wise use of Different Types of Treatments

In most states and union territories (UTs), the use of allopathy was more than 90% (Table-A-1). The highest use of the Indian systems of medicine and homeopathy was seen in Mizoram. There are 16 States/UTs where the use of ISM & H was more than the national average (6%). In seven states and UTs, namely Mizoram (24%), Meghalaya (19%), Arunachal Pradesh (14%), Chhattisgarh (14%), Dadra & Nagar Haveli (14%), Kerala (11%) and West Bengal (10%), the use of ISM & H was 10% or above. It is to be noted that 17% of patients in Gujarat and 11% in Lakshadweep did not go for any treatment, which was much higher than the national average (4%).

3.2 Utilization of ISM & H by Type of Diseases

In most states/UTs, the use of Indian systems of medicine and homeopathy for non-communicable diseases was more than that for communicable diseases. At the national level, 4% of respondents reported suffering from CDs, 7% of those suffering from NCDs and 9% of those who said other diseases had sought the treatment under the ISM & H (Table A-2). Once again, in Mizoram (20%), Lakshadweep (12%) and Kerala (11%) showed relatively higher (more than 10%) utilization of ISM & H in treating communicable diseases compared with other states and UTs. In contrast, 11 states/UTs, namely Meghalaya (62%), Mizoram (28%), Arunachal Pradesh (22%), Chhattisgarh (20%), Chandigarh (18%), D & N Haveli (16%), Odisha (13%), Bihar (12%), and 11% each in West Bengal, Kerala and Himachal Pradesh have shown higher utilization of ISM & H in treating NCDs. Interestingly, among those respondents who suffered from other than CDs and NCDs, nearly one-fourth used ISM & H in Punjab (24%), 13% in Rajasthan and 12% each in Uttar Pradesh and West Bengal. Figure 1 and 2 depict the top 10 states/UTs for the highest usage of ISM & H among respondents who have suffered from CDs and NCDs, respectively.

Figure-1: Bar Diagram showing 10 States/UTs Having Highest use of ISM & H for Communicable Diseases, NSS, 2014

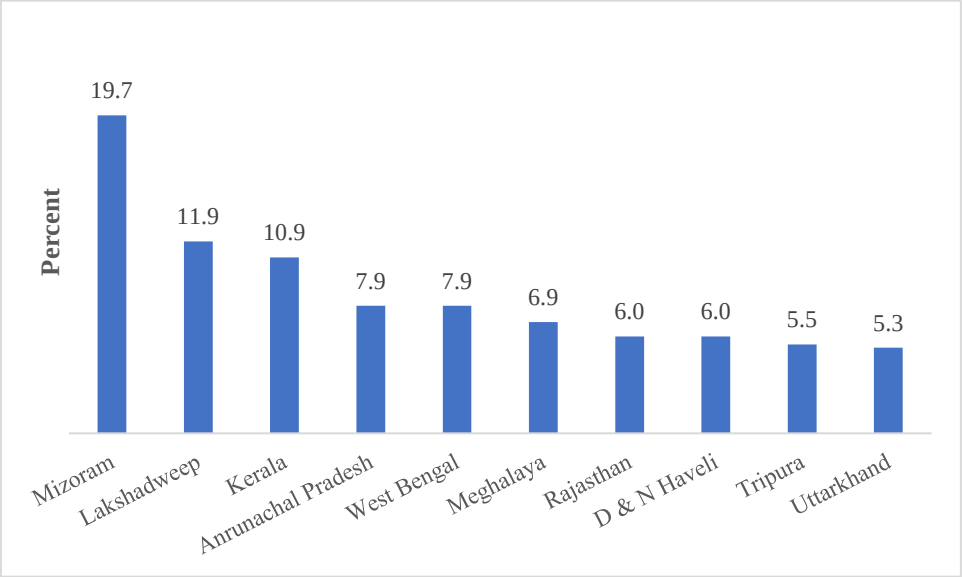
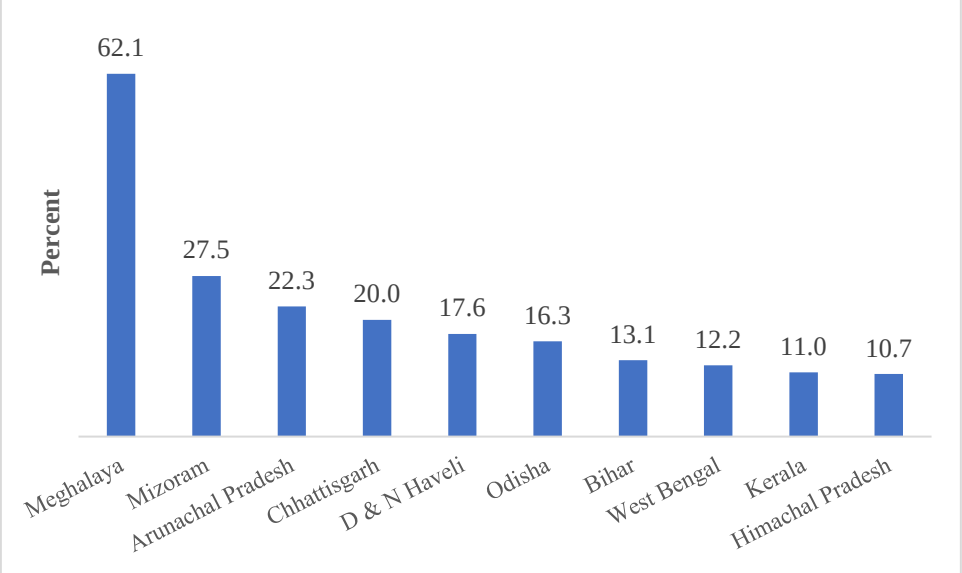


Figure-2: Bar Diagram Showing 10 states/UTs Having the Highest use of ISM & H for Non-Communicable Diseases, NSS, 2014



3.3 Variation in Utilization of ISM & H Care by Sociodemographic Backgrounds

The usage of ISM & H among urban respondents for treating any disease was not significantly different from rural counterparts, nearly 6% each (Table-A-3). The pattern by households' sizes indicates that the utilization of ISM & H remains for treating diseases was high at the small size of 1-5 members' households (6%) then decreases to 5% among 6-10

members' households and again goes up to 7% among households with 11 plus members. In general, it is believed that scheduled castes or scheduled tribes (SCs/STs), due to their lack of accessibility to the allopathy, may be frequent users of ISM & H. On the contrary, the rise in social status shows a gradual increase in the utilization of ISM & H care for treating their morbidities, from 5% among SCs/STs to 7% among others. It is to be noted that no treatment was highest among SCs/STs group of respondents. According to religion, Muslim respondents reported the highest use of ISM & H (8%) than the other two religions (4-6%).

The use of ISM & H was equal among the poor and the rich at 6%, while in the middle tercile, it got reduced to 5 percent. Those respondents who had education upto higher secondary and diploma, showing a higher proportion of using ISM & H (7%) than their non-literate counterparts. Marital status reporting as widowed, divorced and separated registered a higher pattern of using ISM & H (7%) for treating diseases than those who reported their marital status as never married (5%). It could be due to age effects as majority of widowed, divorced, and separated tends to be older and hence have higher chance of reporting an NCD.

The usage of ISM & H for any disease among respondents who were self-employed in agriculture was relatively higher (7%) than those who were casual labourers in agriculture, only 3%. A high proportion of ISM & H usage was also seen among respondents among the regular wages and salaried (6%) by occupational structure. The respondent's age is one of the critical backgrounds to study while examining the use of ISM & H as many diseases, especially lifestyle or non-communicable, occur in the middle and older adults. A similar pattern is evident in this analysis as respondents below age 15 years utilize less ISM & H care compared with those age 15 and above (Table-A-3).

A tri-variate analysis was also carried to examine how diseases type and economic status together exert their effects on the usage of ISM & H. The study finds that ISM & H care utilization was lower in the middle strata of economic subgroups than others, irrespective of disease. It remains higher for NCDs across the three economic strata. It also reveals that the highest ISM & H utilization stood at 11% among the rich economic strata in treating diseases like bleeding disorder, decreasing hearing or loss of hearing, mouth/teeth/gums related diseases, lump or fluid in the abdomen, obstetric, symptoms not clear and childbirth–caesarean/normal (Table-1).

Table-1: Distribution of nature of treatment by type of diseases and economic status, NSS, 2014

Communicable Diseases							
MPCE	**Allopathy**	**ISoM and Homeopathy**	**Others**	**No treatment**	**Sample size**	**$\chi 2$ value**	**p-value**
Poor	91.5	4.2	0.5	3.8	4775	18.6	p<0.01
Middle	93.0	3.1	0.6	3.3	2475		
Rich	91.5	4.7	0.7	3.3	5611		

Non-Communicable Diseases							
Poor	87.0	7.4	0.8	4.8	6361	143.9	p<0.001
Middle	89.5	6.1	0.8	3.6	3970		
Rich	91.2	6.3	0.6	1.9	12527		
Other Diseases							
Poor	83.9	8.7	0.2	7.2	443	10	p=0.123
Middle	84.7	4.7	2.9	7.8	295		
Rich	82.7	11.2	0.9	5.3	825		

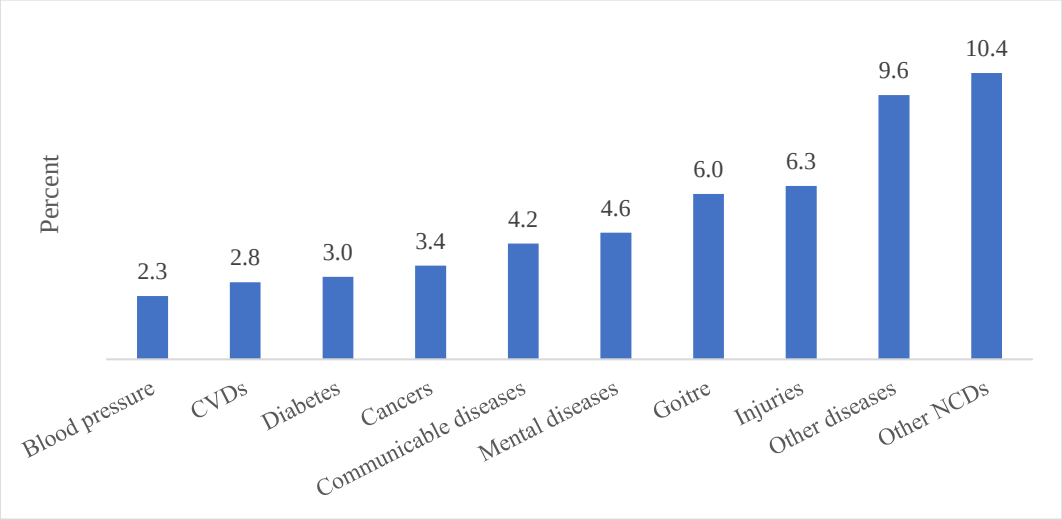
Source: Authors' calculations from the dataset; **Other diseases include** Bleeding disorder, Decreasing hearing or loss of hearing, Diseases of mouth/teeth/gums, Lump or fluid in abdomen, Obstetric, symptoms not clear and Childbirth–Caesarean/normal. Estimated are weighted using multipliers given in the dataset.

3.4 Nature and Sources of Treatment by Types of Diseases

This analysis finds that allopathy is the prime nature of the treatment, but some deviating features can be observed in Table-A-4 and Figure-3. In Figure-3, one can see that at least 6% of respondents suffered from Injuries, and Goiter reported using ISM & H care. The percentage of respondents who reported to use ISM & H for treating blood pressure, CVDs, diabetes, cancer, and mental disease lies in the range of 2-5 percent. However, ISM & H use was relatively higher among those who suffered from other NCDs and for the disease other than NCDs and CDs.

It is striking to note that more than 6% of respondents who suffered from mental diseases and other diseases remained untreated at the time of the survey and did not access any system of medicine or care till the time of the survey. The proportion of such respondents who suffered from other NCDs, any injury, and Cancers and did not seek treatment from either of the systems of medicine ranges 4-5% (Table-A-4).

Figure-3: Bar diagram showing use of ISM & H for treatment of selected diseases, NSS, 2014



The private sector providers were the leading source of treatment for any type of disease in both allopathy (61%~82%) and ISM & H systems (24%~100%) of medicines (Table-A-5). Nevertheless, there has been a huge variation in the use of ISM & H for treating different types of diseases from the public sector. Among those respondents who sought ISM & H care for cancer, injury and blood pressure, less than 10 percent received through the public health system. On the other hand, the public sector utilization among ISM & H was found relatively higher for CVDs (15%), diabetes (16%) and goitre (27%) and was highest among mental diseases (76%). Twenty-seven percent of ISM & H users for treating the other NCDs received care from the public health sector providers. In contrast, the proportion of respondents who used public health services to treat communicable diseases among ISM & H users stood at 21 percent. The usage was a bit lower among patients suffered from the other diseases (15%).

3.5 Association between sociodemographic characteristics and use of ISM & H─ Results from the Multivariate Logistic Regression

Three different run of logistic regression analysis were performed and differ only by consideration of the set of independent variables and knowledge based on the available literature. First of all, the model-1 presented in the Table-2 was run, which comprised only a few most basic characteristics (place of residence, family size, caste, and religion) of respondent. Thereafter, the model-2 was run adding three variables (education, economic status of household, marital status) to test whether these backgrounds make significant difference in seeking ISM & H treatment in presence of those background in the base model-1. Finally, the model-3 was run after inserting three more independent variable (occupation, age and type of diseases). Our prime objective was to examine whether type of disease makes any significant and independent difference in seeking ISM & H treatment controlling the effects of other independent variables. The variable occupation and age in the third model also reflect and capture indirect and direct effects of life-style and cohort respectively.

From the analysis, it is clear that the association between background characteristics and the usage of ISM & H can be spurious unless the type of disease is controlled (Table-2). Therefore, the type of disease has also been taken as one of the predictors of ISM & H usage in the multivariate regression analysis. This analysis reveals that the use of ISM & H was significantly higher among those respondents who suffered from any NCDs (1.4 times) and other diseases (1.6 times) than those who suffered from any CDs, respectively.

After the type of disease, the occupational background of respondents has a significant association with the usage of ISM & H in India. Those respondents who worked as casual agricultural labourers and worked as regular wages/salaried were 31 and 17 percent less likely to use ISM & H care for their morbid conditions than the workers in self-employed in

agriculture. On the other hand, those respondents who belong to the middle strata of MPCE were 16 percent less likely to seek ISM & H care.

Opposite to the common notion, this analysis finds that the odds of seeking ISM & H care for treating diseases increases significantly with the rise in educational attainments to 1.2 times among primary educated to 1.3 times among graduates or higher educated respondents from non-literate respondents.

On the other hand, the respondent's religion is significantly associated with seeking ISM & H care for treating diseases, as Hindu and other religions' respondents had respectively 23 and 20 percent lower chances of using it than their Muslim counterparts. The likelihood of seeking ISM & H treatment among respondents belonging to family size 6-10 members, other castes/tribe, currently married was significantly lower, in the range of 16-20 percent, than their counterparts in the respective reference group. The differentials merely in age and residence of respondents did not make any significant association with the use of ISM & H care in India.

It is to be noted that two more backgrounds 'Graduate and above' in education and 'currently married' in marital status have emerged in effects as statistically significant in the model-3 from insignificant in the model-2. Our understanding true to the Indian context for reason behind such an emergence may be through controlling the possible interaction (in the model-3) between higher education and occupation and between marital status and age. In general, the regular salary/wages jobs are highly common among graduate and above educated individuals. Furthermore, current marital status is more prevalent in a specific age bracket, and most probably in 15-59 years.

Table-2: Odds Ratio resulted from Multivariate Logistic Regression, for using the Indian System of Medicine and Homeopathy by Background Characteristics, NSS, 2014

Background Characteristics	Model-3		Model-2		Model-1	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Residence						
Rural^{R}	1.00	[1.00,1.00]	1.00	[1.00,1.00]	1.00	[1.00,1.00]
Urban	1.00	[0.89,1.13]	1.01	[0.91,1.12]	1.03	[0.93,1.13]
Family size						
1-5^{R}	1.00	[1.00,1.00]	1.00	[1.00,1.00]	1.00	[1.00,1.00]
6-10	0.84**	[0.76,0.94]	0.86**	[0.77,0.96]	0.82***	[0.74,0.91]
11+	0.95	[0.73,1.22]	0.97	[0.75,1.25]	0.91	[0.71,1.17]
Caste						
SCs/STs^{R}	1.00	[1.00,1.00]	1.00	[1.00,1.00]	1.00	[1.00,1.00]
OBC	0.88	[0.78,1.00]	0.91	[0.80,1.03]	0.91	[0.80,1.03]
Others	0.86*	[0.75,0.99]	0.89	[0.78,1.01]	0.9	[0.79,1.02]
Religion						

Background Characteristics	Model-3		Model-2		Model-1	
	OR	95% CI	OR	95% CI	OR	95% CI
Muslim[R]	1.00	[1.00,1.00]	1.00	[1.00,1.00]	1.00	[1.00,1.00]
Hindu	0.80***	[0.70,0.91]	0.79***	[0.70,0.90]	0.80***	[0.70,0.91]
Others	0.77*	[0.63,0.95]	0.77*	[0.63,0.94]	0.78*	[0.64,0.96]
Economic Status (MPCE tercile)						
Poor (First) [R]	1.00	[1.00,1.00]	1.00	[1.00,1.00]		
Middle (Second)	0.84*	[0.73,0.98]	0.86*	[0.74,0.99]		
Rich (Third)	0.89	[0.79,1.01]	0.90	[0.80,1.02]		
Education						
Non-literate[R]	1.00	[1.00,1.00]	1.00	[1.00,1.00]		
Primary	1.21**	[1.06,1.39]	1.19**	[1.06,1.35]		
Higher secondary and diploma	1.25**	[1.08,1.44]	1.25***	[1.10,1.41]		
Graduation and above	1.27*	[1.01,1.59]	1.24	[1.00,1.53]		
Marital status						
Never married[R]	1.00	[1.00,1.00]	1.00	[1.00,1.00]		
Currently married	0.80*	[0.67,0.96]	0.94	[0.84,1.06]		
Widowed, divorced and separated	0.95	[0.76,1.20]	1.14	[0.98,1.33]		
Occupation						
Self-employed in agriculture[R]	1.00	[1.00,1.00]				
Casual labour in agriculture	0.69**	[0.54,0.87]				
Self-employed in non-agriculture	0.97	[0.83,1.15]				
Regular wage/salary	0.83*	[0.70,0.98]				
Casual labour in non-agriculture	1.03	[0.87,1.23]				
Others	0.85	[0.69,1.05]				
Age in years						
0-4[R]	1.00	[1.00,1.00]				
5-14	0.84	[0.66,1.08]				
15-59	0.93	[0.73,1.20]				
60+	0.94	[0.71,1.24]				
Type of diseases						
Communicable diseases[R]	1.00	[1.00,1.00]				

Background Characteristics	Model-3		Model-2		Model-1	
	OR	95% CI	OR	95% CI	OR	95% CI
Non-communicable diseases	1.39***	[1.22,1.57]				
Other diseases	1.59***	[1.26,2.00]				

[R] represents the reference group; *p<0.05, **p<0.01, ***p<0.001 CI: confidence interval; OR: Odds Ratio

4. Discussion and Conclusion

The Indian Systems of Medicine (ISM), comprising Ayurveda, Yoga, Unani, and Siddha, was practiced even before any formal health system of medicine came into existence. In most of the Indian states, the use of the allopathic system of medicine is higher as compared with the Indian Systems of Medicine & Homeopathy. This could be due to faith in the allopathic drugs and quick relief from the use of these medicines as everyone needs to be recuperated soon in the fast of life contemporary world. On the contrary, there have been anecdotal saying, beliefs, and evidence that might have encouraged the use of ISM & H in India particularly. For example, the most famous of them is that the ISM & H treatment does not have any side effects or contraindications to the patient. The other popular one is that the ISM & H treatment cures the root cause of the disease, not the symptoms and hence can provide complete healing to the human body. Our analysis of the NSS dataset 71st (2014) in this article confirms that there have been a few areas where the use of ISM & H was more common than others. A few states/UTs like Mizoram, Meghalaya, Arunachal Pradesh, Chhattisgarh and West Bengal in the northeast and eastern region and Kerala in the south Dadra and Nagar Haveli in the west show higher usage of ISM & H than others.

Nationally, the pattern by type of disease shows that the use of ISM & H remains higher for treating NCDs (7%) than CDs (4%). There are a few states/UTs that did not show much use of ISM & H treatment as a whole, but they have shown significantly higher utilization of ISM & H services for NCDs compared with the national average. These states include Chandigarh (18%), Bihar (12%) and Himachal Pradesh (11%). Hence, one can infer that the majority of states that comprise sizeable hilly terrain in their topography or comprise a relatively large proportion of the tribal population had a higher prevalence of ISM & H use than others.

The use of ISM & H by sociodemographic backgrounds reveals that respondents in larger household family sizes, castes other than SCs/STs and OBCs, Muslim by religion and widowed, divorce and separated in marital status, for treatment of NCDs and other diseases have reported higher usage of ISM & H than other subgroup categories. However, the multivariate regression analysis did suggest an independent statistically significant association between some of the background characteristics and the ISM & H utilization. The results showed higher use of ISM & H among Muslim respondents irrespective of the

type of disease. This could be due to the higher use of Unani medicines due to their beliefs and prevailing knowledge regarding the system and the widespread availability of Unani providers within the community.

Education attainment has significantly positive and increasing effects on the ISM & H usage in India, and confirmed the others' finding that a higher proportion of educated respondents reported the traditional medicines (Singh 2005; Yarney et al., 2013). There could be several reasons behind such a strong association. One could be the better accessibility and affordability of the ISM & H system among educated folks than others. The education may enhance the individual's capacity for self-use of several well-known medications available in the open market for CDs and NCDs. The other is the penetration of promotional advertisement of many ISM & H medicines may be higher among educated patients who have higher mass media exposure than their non-literate counterparts. The other significant finding of this work is that the low use of ISM & H among casual agricultural labourers and daily wagers/regular salaried employees could be due to the necessity of their presence at the workplace. Therefore, they might have preferred the other systems, often allopathy, over the ISM & H.

The likelihood of higher usage of ISM & H among those suffering from NCDs and other diseases indicates that the people might have preferred the system due to hassle-free availability, i.e. without any medical prescription, faith in herbal and traditional healings methods, common knowledge and perception about the medicines and procedures and their low or no side effects properties. As states earlier, a common belief about the ISM & H that it cures the root cause of the disease might be significantly associated with its higher use for NCDs.

This paper also brings out a few vital policy recommendations. Firstly, the use of ISM & H from public sources is quite low for most of the selected diseases considered for the analysis. Therefore, the Department of AYUSH requires making additional efforts towards promoting the ISM & H equally in the public and private sectors. The most important is to conduct and document scientific and systemic AYUSH clinical trials so that patents and approvals can be sought from international bodies for global recognition. As others pointed out, the preparations of ISM & H medicines are either as single herbs or as collections of herbs in composite formulae. That is why quality control of oriental herbal drugs is more difficult than that of western drugs. Thus, the quantity and quality of traditional medicine's safety and efficacy data are far from sufficient to meet the criteria needed to support its use worldwide (Thillaivanan and Samraj, 2014).

Secondly, as mental health problems are on the rise around the country, the finding that a relatively higher proportion (6%) of respondents did not seek any kind of treatment for mental disorders, and the majority among those sought ISM & H care received it from the

public sources. This pattern can be exploited in maintaining the public health standards of ISM & H care and launching necessary IEC campaigns in the promotion of treatment-seeking for mental disorders.

This will reduce the burden of disease and increase India's disease-free life expectancy in the near future. It requires a strong network service delivery, personnel, supply chain, scientific protocols, referral system and continuous research and development and investment in the Indian System of Medicine. This can help to preserve thousands of years of acquired knowledge in enhancing human survival and quality of life.

4.1 Strengths and Limitations

This study has several strengths and a few limitations too. This paper gives enough evidence that many patients in India are managing communicable and non-communicable diseases with the Indigenous Indian system of medicines. The prevalence of NCDs in the lowest economic tercile may grow as time passes due to changing lifestyle and the occupational structure. This article finds that a larger proportion of NCDs patients in the lowest tercile of MPCE were using ISM & H compared with the middle and rich tercile; hence this finding can directly be used in policy framing. Thus, there is a need to make AYUSH treatment available at the lowest level of the public health facilities countrywide, including sub- and primary health centers.

In the limitations, this study could not perform disease-wise deeper analysis due to insufficient sample size; for the same reason, the association between duration of disease and the use of ISM & H could not be established. Finally, this study recommends a few questions in the future round of health consumption to assess the effects of the treatment by type on a few critical CDs, NCDs or other ailments. A few questions as examples have been listed below.

1. Which kind of treatment do you think is mainly responsible for curing or ameliorating the condition of your disease?
2. How long did the treatment continue for a complete cure?
3. Did you switch from one system of medicine to the other, and why (reasons) and how often?
4. Did you adhere to the system's protocols, drug adherence and regime during treatment?
5. Did you go to a professional and well-trained provider? (Applicable only to those who sought treatment from a private provider).
6. Did you opt for self-use for the ISM & H? If yes, how often did you do and why? Where did you get information using the ISM & H?

Acknowledgment

We are grateful to the anonymous referees for reviewing our paper and providing valuable technical and editorial inputs to improve upon the original submission. We are also thankful to the Survey Coordination Division, National Statistical Office for their efforts and making timely NSS data available for researchers and to the Editorial Advisory Board of the journal for considering our article for publication. The analysis and interpretations in this article are solely drawn by the authors and do not necessarily reflect the position of the affiliated institutions or their governing boards.

References:

1. Albert, S. and Porter, J. (2915). Is 'mainstreaming AYUSH' the right policy for Meghalaya, northeast India? BMC. *Complement Altern Med* 2015;15:288.
2. Calixto, J. B. (2000). Efficacy, safety, quality control, marketing and regulatory guidelines for herbal medicines (phytotherapeutic agents). *Brazilian Journal of Medical and Biological Research*, *33*(2), 179-189.
3. Chatterjee, B., Biswas, P.C., and Pancholi, J. (2012). Health awareness and popularity of alternative medicines among people of Jamnagar town: A cross-sectional study. AYU (Int Q J Res Ayurveda) 2012; 33:33.
4. Chellappandian, M., Mutheeswaran, S., Pandikumar, P., Duraipandiyan, V. and Ignacimuthu, S. (2012). Quantitative ethnobotany of traditional Siddha medical practitioners from Radhapuram taluk of Tirunelveli District, Tamil Nadu, India. *Journal of ethnopharmacology*, *143(2)*, 540-547.
5. Dubey, N. K., Kumar, R., and Tripathi, P. (2004). Global promotion of herbal medicine: India's opportunity. *Current Science*, *86*(1), 37-41.
6. Kamboj, V. P. (2000). Herbal medicine. *Current Science*, *78*(1), 35-39.
7. International Classification of Diseases, Tenth Revision (ICD-10). http://www.who.int/classifications/apps/icd/icd10online, 2007.
8. Mukherjee, P. K. (2002). *Quality control of herbal drugs: an approach to evaluation of botanicals*. Business Horizons, 1-6.
9. Mahal, A. Karan, A., Engelgau, M. (2010). The Economic Implications of Non-Communicable Disease for India. Health, Nutrition and Population (HNP) discussion paper; World Bank, Washington, DC. *https://openknowledge.worldbank.org/handle/10986/13649* [Accessed on 30/03/2022].
10. Mukherjee, P. K., Venkatesh, M., and Kumar, V. (2007). An overview on the development in regulation and control of medicinal and aromatic plants in the Indian system of medicine. *Boletín Latinoamericanoy del Caribe de Plantas Medicinalesy Aromáticas*, *6*(4), 129-137.
11. Muthu, C., Ayyanar, M., Raja, N., and Ignacimuthu, S. (2006). Medicinal plants used by traditional healers in Kancheepuram District of Tamil Nadu, India. *Journal of Ethnobiology and Ethnomedicine* 2006, 2-43.
12. Nurolaini, K., Wint, Z., Jaini, N., Jaludin, N., Hamid, M., and Linda, Y. (2014). Prevalence of the use of traditional medicine in Brunei Darussalam. *J Homeop Ayurv Med, 3(155)*, 2167-1206.
13. Ramachandran, R. (2006). For better regulation. *Frontline*, *23*(2).
14. Ravishankar, B., and Shukla, V. J. (2007). Indian systems of medicine: a brief profile. *African Journal of Traditional, Complementary and Alternative Medicines*, *4*(3), 319-337.

15. Samal, J. and Dehury, R. (2019). Utilization, preference, perception and characteristics of people adopting traditional and AYUSH systems of medicine in India: a systematic review. Journal of Complementary and Integrative Medicine, 16(2), 20180020 https://doi.org/10.1515/jcim-2018-0020.
16. Singh, P., Yadav, R. J., and Pandey, A. (2005). Utilization of indigenous systems of medicine & homoeopathy in India. *Indian Journal of Medical Research, 122(2)*, 137.
17. Thillaivanan, S., and Samraj, K. (2014). Challenges, constraints and opportunities in herbal medicines-a review. *International Journal of Herbal Medicine, 2(1)*, 21-24.
18. WHO Media Centre: Traditional Medicine. Fact sheet N°134 2008 [http://www.who.int/mediacentre/factsheets/fs134/en/], (Accessed June 2011).
19. World Health Organization (WHO): Traditional Medicine Strategy 2002-2005. WHO/EDM/TRM/2002.1,Geneva7[http://whqlibdoc.who.int/hq/2002/who_edm_trm_2002.1.pdf], (Accessed June 2011).
20. Yarney, J., Donkor, A., Opoku, S. Y., Yarney, L., Agyeman-Duah, I., Abakah, A. C., and Asampong, E. (2013). Characteristics of users and implications for the use of complementary and alternative medicine in Ghanaian cancer patients undergoing radiotherapy and chemotherapy: a cross-sectional study. *BMC Complementary and Alternative Medicine, 13(1)*, 1-9.

Appendix-A

Table-A-1: State-wise percent distribution of nature of treatment received for any disease, NSS, 2014

State	Allopathy	ISM & H	Others	No. treatment	Sample size
Jammu & Kashmir	98.8	1.1	0.2	0.0	451
Himachal Pradesh	87.9	8.2	1.0	2.9	399
Punjab	95.8	2.6	1.6	0.0	1414
Chandigarh	91.9	8.1	0.0	0.0	167
Uttarakhand	91.9	5.9	1.0	1.3	234
Haryana	92.6	4.6	1.0	1.7	627
Delhi	98.5	1.1	0.3	0.1	229
Rajasthan	91.2	6.0	0.1	2.6	1165
Uttar Pradesh	89.2	7.4	0.7	2.9	3995
Bihar	88.9	8.2	0.3	2.6	947
Sikkim	99.8	0.2	0.0	0.0	121
Arunachal Pradesh	77.9	13.7	3.4	5.1	186
Nagaland	82.1	3.2	14.6	0.2	69
Manipur	99.7	0.3	0.0	0.0	110
Mizoram	75.4	24.4	0.2	0.0	126
Tripura	95.0	4.8	0.0	0.2	253
Meghalaya	70.0	19.0	4.7	6.3	104
Assam	96.3	2.6	0.2	0.9	317
West Bengal	84.4	10.0	0.6	5.0	4271
Jharkhand	86.2	2.2	3.7	7.9	559
Odisha	89.8	7.6	0.7	1.9	1280
Chhattisgarh	80.1	13.5	4.1	2.2	405
Madhya Pradesh	92.8	3.5	0.1	3.6	1389
Gujarat	80.4	2.7	0.5	16.5	1910
Daman & Diu	99.5	0.5	0.0	0.0	67
Dadra & Nagar Haveli	81.3	13.5	1.2	4.0	71
Maharashtra	93.1	2.9	0.6	3.5	2501
Andhra Pradesh	95.8	1.7	1.0	1.5	3283
Karnataka	94.9	2.9	0.4	1.8	1879
Goa	96.9	0.6	0.1	2.4	146
Lakshadweep	80.6	8.1	0.0	11.4	182
Kerala	85.1	10.6	0.6	3.7	4467

State	Allopathy	ISM & H	Others	No. treatment	Sample size
Tamil Nadu	93.9	3.4	0.1	2.7	3365
Puducherry	97.8	2.2	0.0	0.0	282
A & N Islands	80.1	8.1	4.8	7.0	273
India	**90.0**	**5.8**	**0.7**	**3.5**	**37,244**

Sources: Authors' calculations; Estimates are weighted using multipliers provided in the dataset.

Table-A-2: State-wise use of Indian System of Medicine and Homeopathy by Disease type, NSS, 2014

States	CDs (N)	95% CI	NCDs (N)	95% CI	Others (N)	95% CI
Jammu & Kashmir	0.2 (141)	[0.0, 0.9]	1.5 (290)	[0.0, 2.9]	2.3 (20)	[0.0, 9.4]
Himachal Pradesh	3.4 (104)	[0.0, 7.0]	10.6 (285)	[7.0, 14.2]	0.0 (10)	[0.0, 0.0]
Punjab	1.1 (513)	[0.2, 2.0]	2.5 (856)	[1.4, 3.5]	23.7 (45)	[10.8, 36.6]
Chandigarh	0.2 (55)	[0.0, 1.4]	17.6 (101)	[10.0, 25.1]	1.8 (11)	[0.0. 11.3]
Uttarakhand	5.3 (131)	[1.4, 9.1]	7.4 (99)	[2.1, 12.6]	0.0 (4)	[0.0, 0.0]
Haryana	2.1 (93)	[0.4, 3.7]	7.9 (313)	[4.9, 10.9]	2.7 (21)	[0.0, 10.3]
Delhi	0.1 (96)	[0.0, 0.5]	2.8 (128)	[0.0, 5.7]	0.0 (5)	[0.0, 0.0]
Rajasthan	6.0 (485)	[3.8, 8.1]	5.4 (624)	[3.6, 7.1]	12.9 (56)	[3.8, 21.9]
Uttar Pradesh	5.2 (1625)	[4.1, 6.3]	9.1 (2145)	[7.9, 10.3]	12.2 (216)	[7.8, 16.6]
Bihar	5.3 (474)	[3.3, 7.3]	12.2 (450)	[9.2, 15.3]	0.0 (23)	[0.0, 0.0]
Sikkim	0.0 (31)	[0.0, 0.0]	0.4 (80)	[0.0, 1.7]	0.0 (10)	[0.0, 0.0]
Arunachal Pradesh	7.9 (136)	[3.3, 12.5]	22.3 (46)	[9.8, 35.2]	80.0 (4)	[65.3, 153.5]
Nagaland	3.8 (45)	[0.0, 9.6]	0.6 (23)	[0.0, 4.1]	0.0 (1)	[0.0, 0.0]
Manipur	0.0 (66)	[0.0, 0.0]	0.0 (41)	[0.0, 0.0]	0.0 (3)	[0.0, 0.0]
Mizoram	19.7 (55)	[8.8, 30.5]	27.5 (66)	[16.4, 38.5]	0.0 (5)	[0.0, 0.0]
Tripura	5.5 (160)	[1.9, 9.0]	4.5 (83)	[0.0, 9.0]	0.0 (10)	[0.0, 0.0]
Meghalaya	6.9 (59)	[0.2, 13.5]	62.1 (36)	[45.5, 78.8]	5.4 (9)	[0.0, 23.7]
Assam	2.3 (133)	[0.0, 4.9]	2.4 (156)	[0.0, 4.9]	8.2 (28)	[0.0, 18.9]
West Bengal	7.9 (1306)	[6.4, 9.4]	11.0(270)	[1.0, 12.2]	12.3 (263)	[8.3, 16.3]
Jharkhand	1.4 (259)	[0.0, 2.8]	2.8 (281)	[0.9, 4.7]	0.6 (19)	[0.0, 4.3]
Odisha	3.2 (637)	[1.8, 4.6]	13.1 (604)	[10.4, 15.8]	2.5 (39)	[0.0. 7.6]
Chhattisgarh	10.4 (231)	[6.4, 14.4]	20.0 (164)	[14.0, 26.4]	0.0 (10)	[0.0, 0.0]
Madhya Pradesh	3.4 (600)	[1.9, 4.8]	3.8 (732)	[2.4, 5.2]	0.0 (57)	[0.0, 0.0]
Gujarat	5.3 (688)	[3.6, 7.0]	0.7 (1181)	[0.2, 1.2]	3.3 (41)	0.0, 9.0]
Daman & Diu	0.0 (17)	[0.0, 0.0]	0.7 (46)	[0.0, 3.2]	0.0 (4)	[0.0, 0.0]
D & N Haveli	6.0 (27)	[0.0, 15.6]	16.3 (43)	[4.8, 27.8]	0.0 (1)	[0.0, 0.0]
Maharashtra	0.8 (983)	[0.2, 1.3]	5.2 (1446)	[4.0, 6.3]	0.8 (72)	[0.0, 3.0]
Andhra Pradesh	0.2 (731)	[0.0, 0.5]	2.2 (2478)	[1.6, 2.8]	2.2 (74)	[0.0, 5.7]

States	CDs (N)	95% CI	NCDs (N)	95% CI	Others (N)	95% CI
Karnataka	1.7 (614)	[0.6, 2.7]	3.9 (1200)	[2.8, 5.0]	0.2 (65)	[0.0, 1.2]
Goa	1.2 (76)	[0.0, 3.7]	0.0 (69)	[0.0, 0.0]	0.0 (1)	[0.0, 0.0]
Lakshadweep	11.9 (46)	[2.2, 21.7]	3.9 (122)	[0.4, 7.4]	21.7 (14)	[0.0, 4.6]
Kerala	10.9 (911)	[8.8, 12.9]	10.7(324)	[9.7, 11.8]	8.7 (314)	[5.5, 11.8]
Tamil Nadu	0.8 (940)	[0.2, 1.4]	4.2 (2342)	[3.4, 5.1]	8.9 (83)	[2.6, 15.1]
Puducherry	1.1 (62)	[0.0, 3.7]	2.9 (205)	[0.6, 5.3]	0.0 (15)	[0.0, 0.0]
A & N Islands	0.8 (92)	[0.0, 2.7]	4.5 (171)	[1.3, 7.5]	86.8 (10)	[6.13, 112.3]
India	**4.2(1282)**	**[3.8, 4.5]**	**6.7(2285)**	**[6.4, 7.0]**	**9.1 (1563)**	**[7.6, 10.5]**

Source: Authors' calculations: CDs: Communicable diseases, NCDs; Non-communicable diseases; CI; Confidence Interval; Estimates are weighted using multipliers provided in the dataset.

Table-A-3: Variation in Nature of Treatment by Sociodemographic Backgrounds, NSS, 2014

Background Characteristics	Allopathy	ISM&H	Others	No. Treatment	Sample size	$\chi 2$ value	p-value
Residence							
Rural	89.6	5.6	0.8	4.0	18803	96.8	p<0.001
Urban	90.7	6.2	0.5	2.6	18441		
Family size							
1-5	89.9	6.2	0.6	3.3	22000	19.25	p=0.004
6-10	90.4	4.7	0.8	4.1	13795		
11+	90.2	7.3	0.1	2.4	1449		
Caste							
SC/ST	88.0	4.7	1.1	6.2	8898	162.7	p<0.001
OBC	90.9	5.8	0.4	2.9	15657		
Others	90.3	6.6	0.7	2.3	12689		
Religion							
Muslim	90.2	7.6	0.3	1.9	5590	77.3	p<0.001
Hindu	89.8	5.6	0.7	3.8	28187		
Others	91.6	4.4	1.0	3.0	3467		
Social status							
Poor	88.9	6.0	0.7	4.4	11560	136.9	p<0.001
Middle	90.6	4.9	0.8	3.7	6720		
Rich	90.9	6.0	0.6	2.5	18963		
Education							
Illiterate	90.0	5.1	0.6	4.2	14147	80.2	p<0.001
Primary	90.2	5.6	0.6	3.6	9889		
Higher secondary and diploma	89.8	6.9	0.6	2.7	10777		
Graduation and above	90.3	6.1	1.6	1.9	2130		
Marital status							
Never married	90.7	4.9	1.0	3.4	9924	14.2	p<0.05

Background Characteristics	Allopathy	ISM&H	Others	No. Treatment	Sample size	$\chi 2$ value	p-value
Currently married	90.0	5.8	0.6	3.6	21965		
Widowed, divorced and separated	88.9	7.4	0.4	3.3	5355		
Occupation							
Self-employed in agriculture	86.7	7.2	0.9	5.2	6628	169.4	p<0.001
Casual labour in agriculture	91.1	2.9	1.2	4.9	2543		
Self-employed in non-agriculture	91.5	5.4	0.4	2.8	10317		
Regular wage/salary	91.0	6.0	0.8	2.3	9270		
Casual labour in non-agriculture	88.8	6.2	0.6	4.4	5187		
Others	92.1	5.8	0.4	1.6	3299		
Age in years							
0-4	92.5	4.1	1.0	2.5	4300	52.1	p<0.001
5-14	92.3	4.3	0.9	2.5	2940		
15-59	88.9	6.3	0.7	4.2	19766		
60+	90.7	6.1	0.4	2.9	10238		
Type of diseases							
Communicable diseases	91.8	4.2	0.6	3.5	12822	42.5	p<0.001
Non-communicable diseases	89.3	6.7	0.7	3.3	22859		
Other diseases	83.5	9.1	1.0	6.5	1563		

Source: Authors' own calculations from the dataset. Estimates are weighted using multipliers provided in the dataset.

Table-A-4: Percentage Distribution of Nature of Treatment by Selected Diseases, NSS, 2014

Selected NCDs	Allopathy	ISM & H	Others	No. treatment	Sample size
CVDs	95.2	2.8	0.2	1.9	1901
Injuries	86.1	6.3	3.2	4.5	857
Goitre	92.9	6.0	0.0	1.1	587
Diabetes	95.7	3.0	0.2	1.1	3935
Blood pressure	96.8	2.3	0.3	0.7	4102
Mental disease	88.4	4.6	0.6	6.4	1388
Cancers	92.7	3.4	0.0	3.9	285
Other NCDs	83.6	10.4	1.0	5.0	9613

Communicable diseases	91.7	4.2	0.6	3.5	12793
Other diseases[1]	83.2	9.6	0.9	6.3	1783

Source: Authors' own calculations from the dataset; [1]Other diseases include Bleeding disorder, Decreased in hearing or loss of hearing, Diseases of mouth/teeth/gums, Lump or fluid in abdomen, Obstetric, symptoms not clear and Childbirth–Caesarean/normal. Estimates are weighted using multipliers provided in the dataset.

Table-A-5: Percentage Distribution of Sources of Care by type of Disease and Nature of Treatment, NSS, 2014

Selected NCDs	**Allopathy**		**Sample size**	**ISM&H**		**Sample size**
	Public	**Private**		**Public**	**Private**	
CVDs	24.7	75.3	1766	14.7	85.4	47
Injuries	29.2	70.9	751	5.8	94.2	29
Goitre	18.3	81.7	549	27.1	73.0	19
Diabetes	24.5	75.5	3737	15.8	84.2	83
Blood pressure	25.6	74.4	3901	9.8	90.2	67
Mental disease	28.3	71.7	1070	75.6	24.4	27
Cancers	39.2	60.8	262	0.0	100.0	11
Other NCDs	26.9	73.2	7549	27.3	72.7	713
Communicable diseases	25.0	75.0	10094	21.2	78.8	368
Other diseases[1]	28.1	71.9	1493	15.4	84.6	96

Source: Authors' own calculations from the dataset; [1]Other diseases include Bleeding disorder, Decreased in hearing or loss of hearing, Diseases of mouth/teeth/gums, Lump or fluid in abdomen, Obstetric, symptoms not clear and Childbirth–Caesarean/normal. Estimates are weighted using multipliers provided in the dataset.

Table-A-6: Classification of Ailments Collected in NSS into CD, NCD and Others, 2017-18

Communicable Diseases	
NSS codes	**Ailments**
01	Fever with loss of consciousness or altered consciousness
02	Fever with rash/ eruptive lesions
03	Fever due to Diphtheria, Whooping Cough
04	All other fevers (Includes malaria, typhoid and fevers of unknown origin, all specific fevers that do not have a confirmed diagnosis)
05	Tuberculosis
06	Filariasis
07	Tetanus
08	HIV/AIDS
09	Other sexually transmitted diseases
10	Jaundice
11	Diarrhoeas/ dysentery/ increased frequency of stools with or without blood and mucus in stools

Communicable Diseases	
NSS codes	**Ailments**
12	Worms infestation
14	Anaemia (any cause)
15	Bleeding disorders
17	Under-nutrition
32	Earache with discharge/bleeding from ear/ infections
36	36 Acute upper respiratory infections (cold, runny nose, sore throat with cough, allergic colds included)
37	Cough with sputum with or without fever and NOT diagnosed as TB
43	Skin infection (boil, abscess, itching) and other skin disease
47	Pain the pelvic region/reproductive tract infection/ Pain in male genital area
Non-communicable diseases	
13	Cancers (known or suspected by a physician) and occurrence of any growing painless lump in the body
16	Diabetes
19	Others (including obesity)
20	Mental retardation
21	Mental disorders
22	Headache
23	Seizures or known epilepsy
24	Weakness in limb muscles and difficulty in movements
25	Stroke/ hemiplegia/ sudden onset weakness or loss of speech in half of body
26	other mental problems including memory loss, confusion
29	Glaucoma
30	Decreased vision (chronic) NOT including where decreased vision is corrected with glasses
34	Hypertension
35	Heart disease: Chest pain, breathlessness
38	Bronchial asthma/ recurrent episode of wheezing and breathlessness with or without cough over long periods or known asthma)

Communicable Diseases	
NSS codes	**Ailments**
40	Pain in abdomen: Gastric and peptic ulcers/ acid reflux/ acute abdomen
42	Gastrointestinal bleeding
44	Joint or bone disease/ pain or swelling in any of the joints, or swelling or pus from the bones
45	Back or body aches
46	Any difficulty or abnormality in urination
48	Change/irregularity in menstrual cycle or excessive bleeding/pain during menstruation and any other gynaecological and andrological disorders incl. male/female infertility
52	Accidental injury, road traffic accidents and falls
53	Accidental drowning and submersion
54	Burns and corrosions
55	Poisoning
56	Intentional self-harm
57	Assault
Other diseases	
18	Goitre and other disease of thyroid
27	Discomfort/pain in the eye with redness or swellings/ boils
28	Cataract
31	Others eye problems including disorders of eye
33	Decreased hearing or loss of hearing
39	Diseases of mouth/teeth/gums
41	Lump or fluid in abdomen or scrotum
49	Pregnancy with complication before or during labour (abortion, ectopic, pregnancy, hypertension, complication during labour)
50	Complication in mother after birth
51	Illness in new born/sick new born
59	Symptom not fitting into any of above categories
60	Could not even state the main symptom
88	Childbirth – Caesarean/ normal/ any other (for both live birth and stillbirth)
58	Contact with venomous/harm-causing animals and plants

Source: Mahal, A., Karan, A., Engelgau, M. (2010).

PART-II

Highlights of Report Released by National Statistical Office (NSO)

(The 'Highlights' are reproduced from related report prepared by Survey Design and Research Division (SDRD) of NSO. For details, the reader may refer to the related Main Report)

SARVEKSHANA

Highlights of Recent Survey Report(s) Released by National Statistical Office (NSO)

1. Situation Assessment of Agricultural Households and Land and Livestock Holdings of Households in Rural India, 2019: NSS 77th Round (January to December, 2019).

2. All India Debt & Investment (AIDIS) Survey, 2019: NSS 77th Round (January to December, 2019).

Highlights I- Situation Assessment of Agricultural Households and Land and Livestock Holdings of Households in Rural India: NSS 77th Round (January to December, 2019)

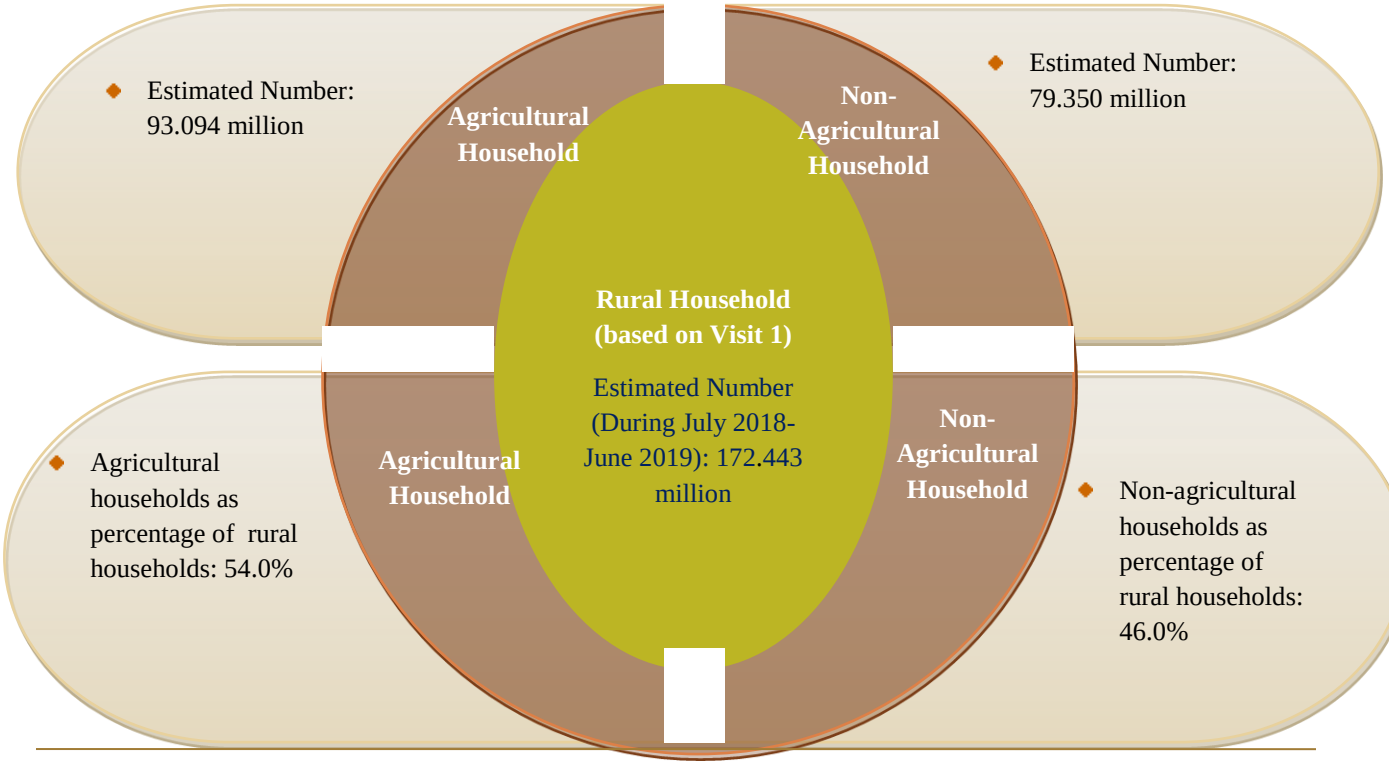
Survey Period

- The National Statistical Office (NSO) carried out a survey on Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households in the rural areas of the country with an integrated schedule of enquiry.
- The survey has been conducted during the period January 2019 to December 2019.
- Information was collected primarily for the agricultural year 2018-19 in two visits (visit-1: information was collected for July-December 2018 and visit-2: information was collected for January-June 2019) and information was collected from the same set of sample households in two visits.

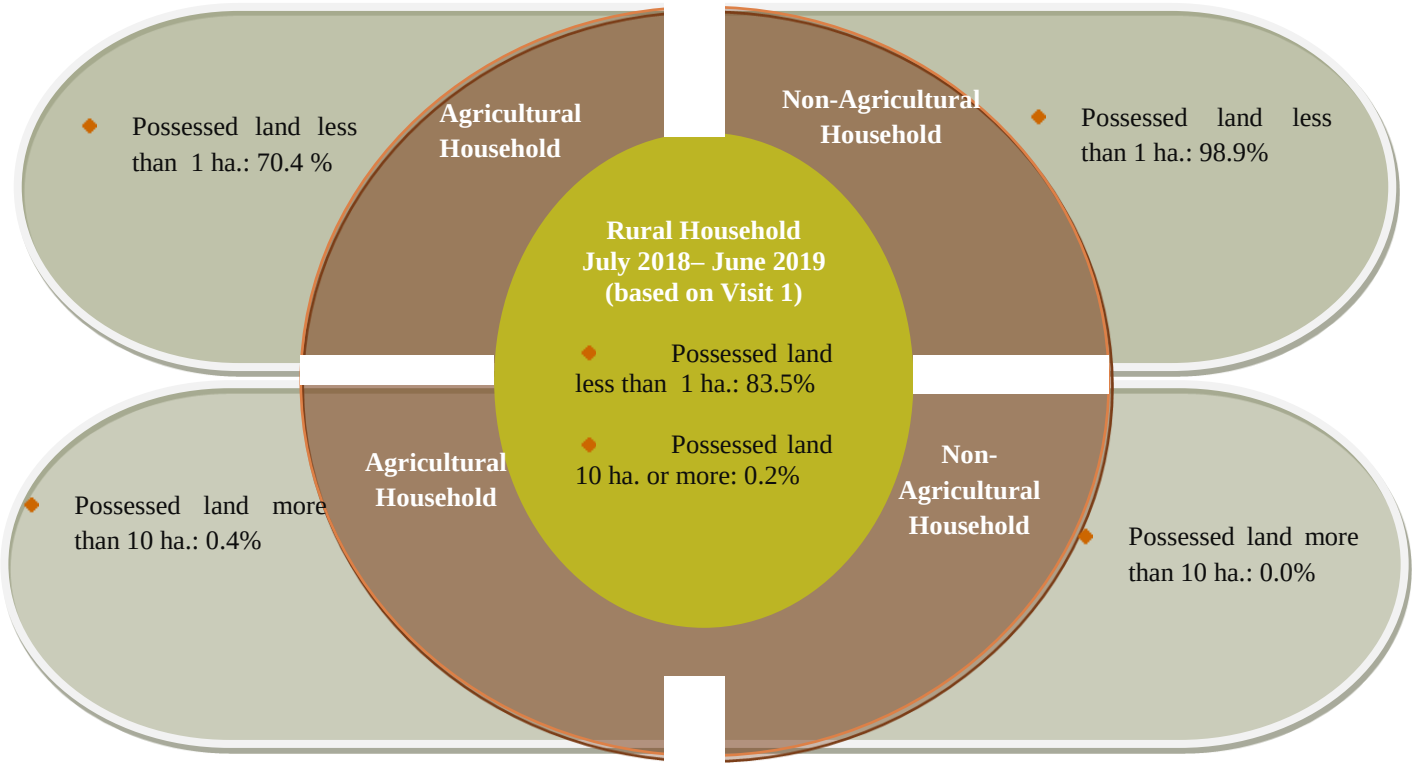
Coverage of Survey

- In the rural areas, 5,940 first stage units were surveyed in visit-1 covering 58,035 households and 5,894 first stage units were surveyed in visit-2 covering 56,894 households.
- The survey covered the whole of rural India except the villages in Andaman and Nicobar Islands which are difficult to access.

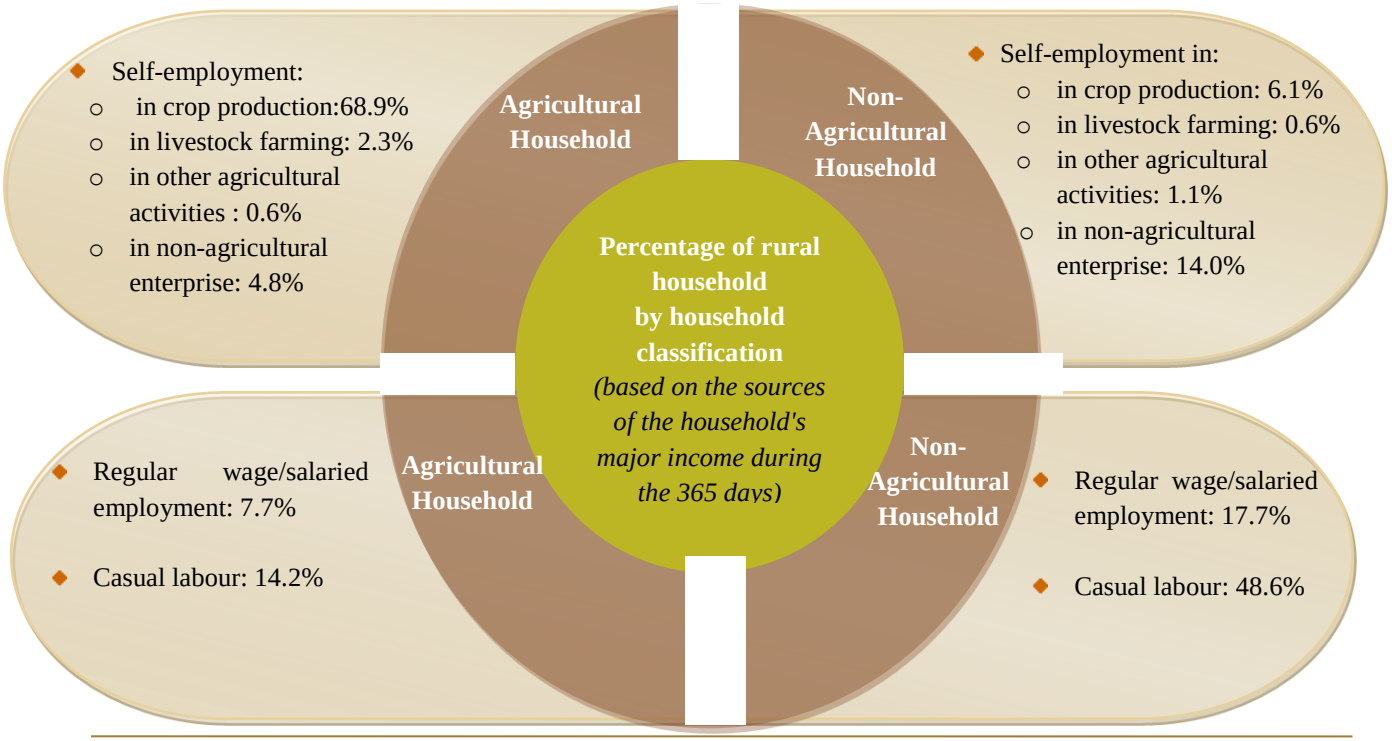
A. Estimated Number of Rural Households



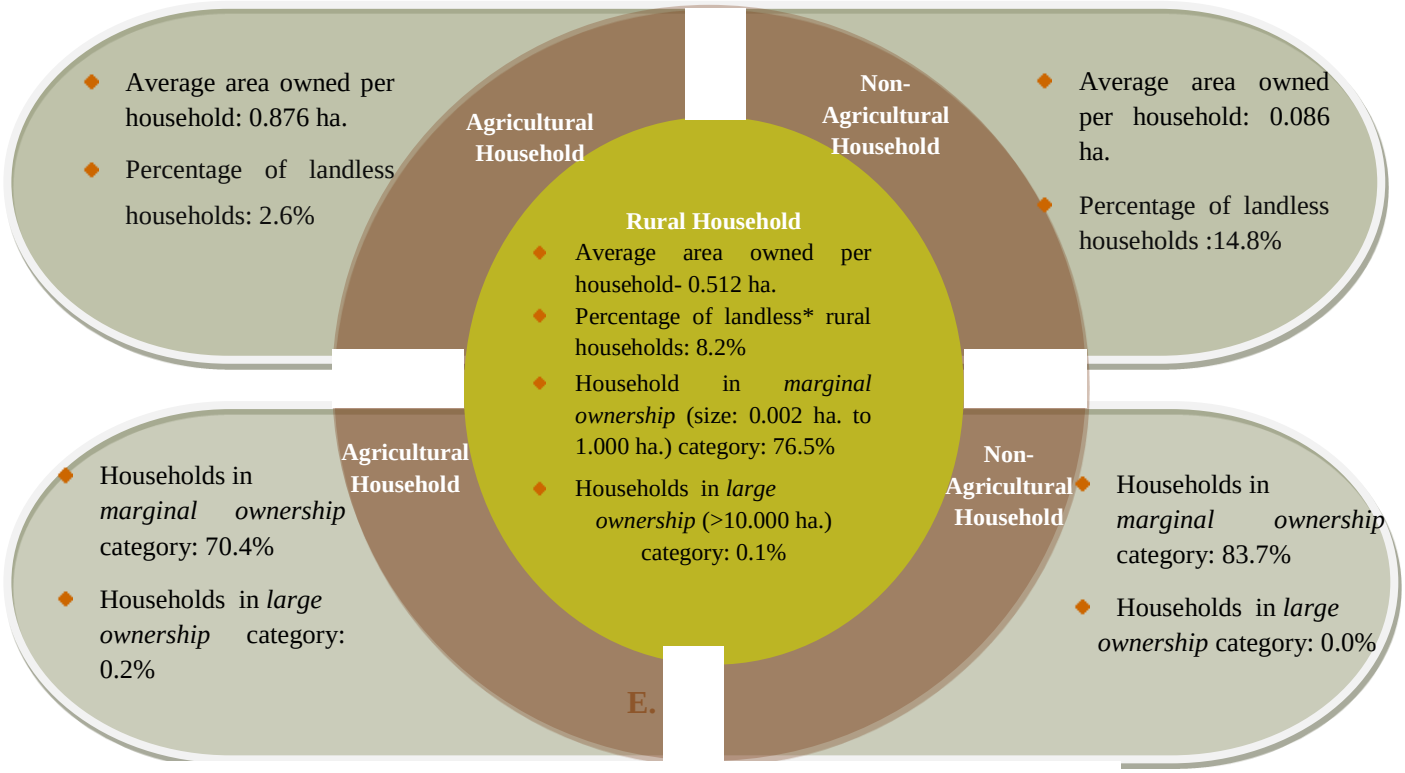
B. Land Possessed by Rural Households



C. Household Classification



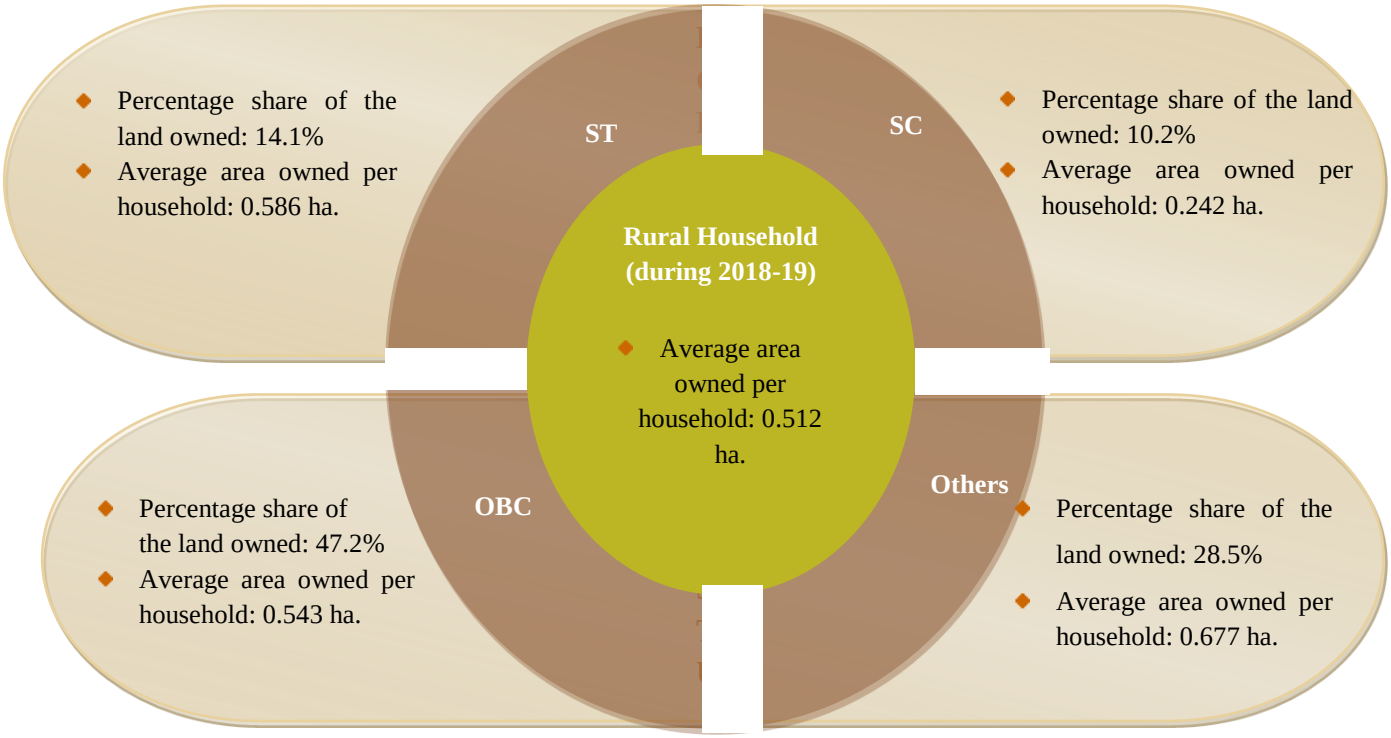
D. Household Ownership Holdings of Land During 2018-19



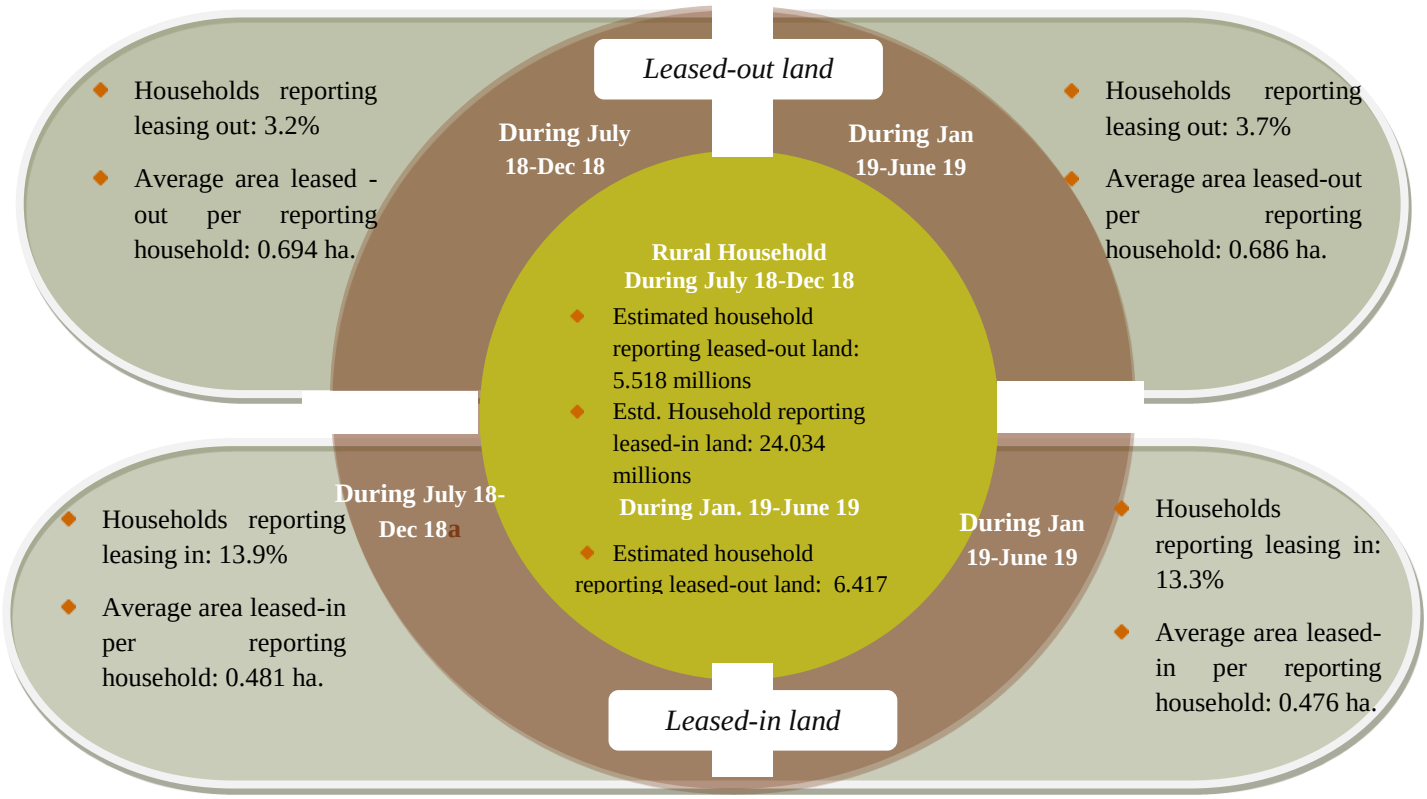
E.

**those with area of ownership holdings 'less than or equal to 0.002 ha. are considered as 'landless'*

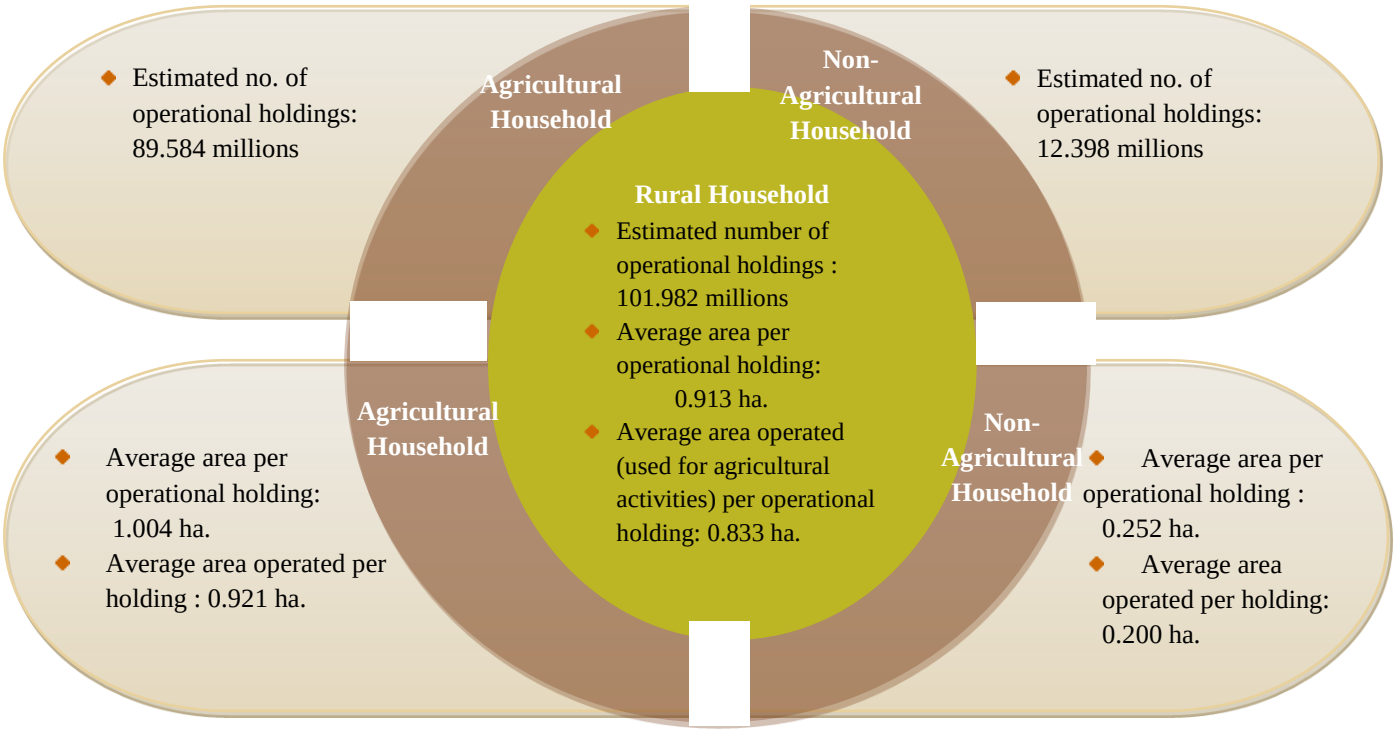
E. Household Ownership Holdings of Land by Social Group During 2018-19



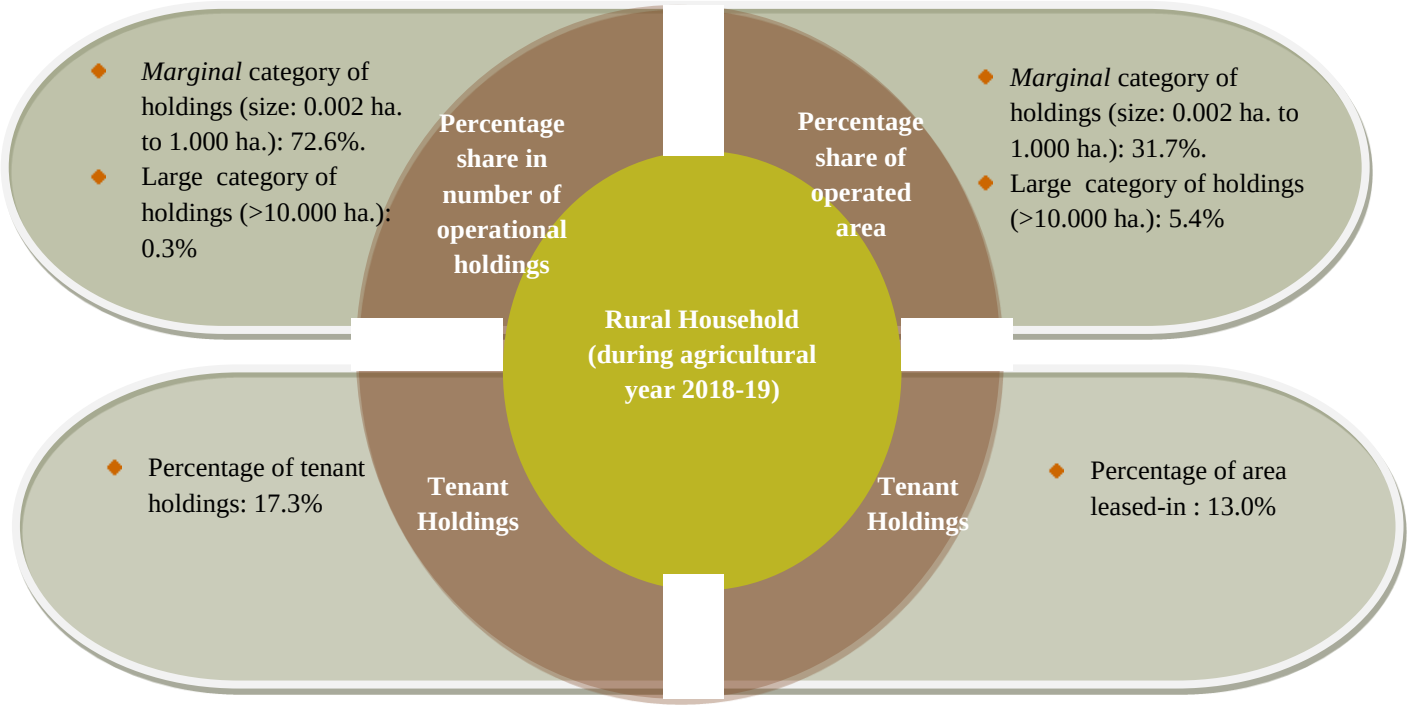
F. Leased-out and Leased-in Land



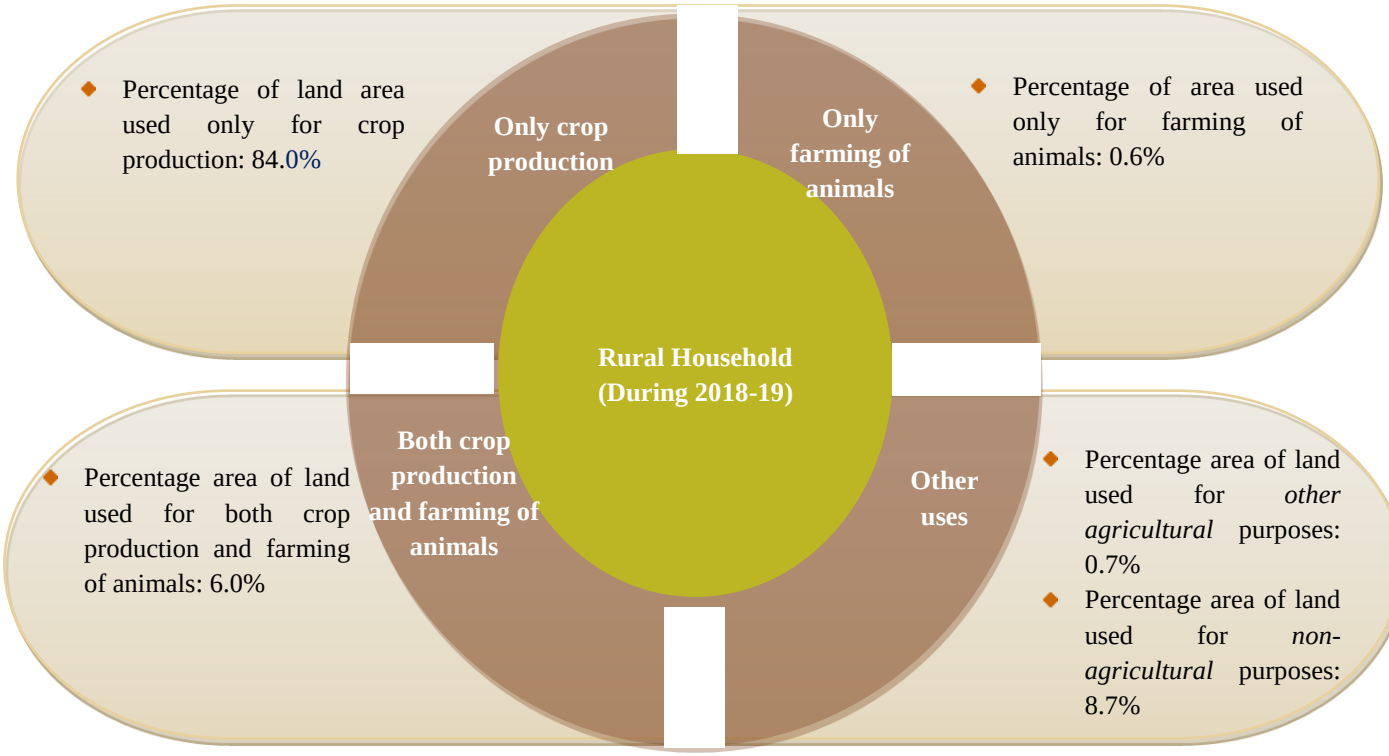
G. Households Operational Holdings of Land During 2018- 2019



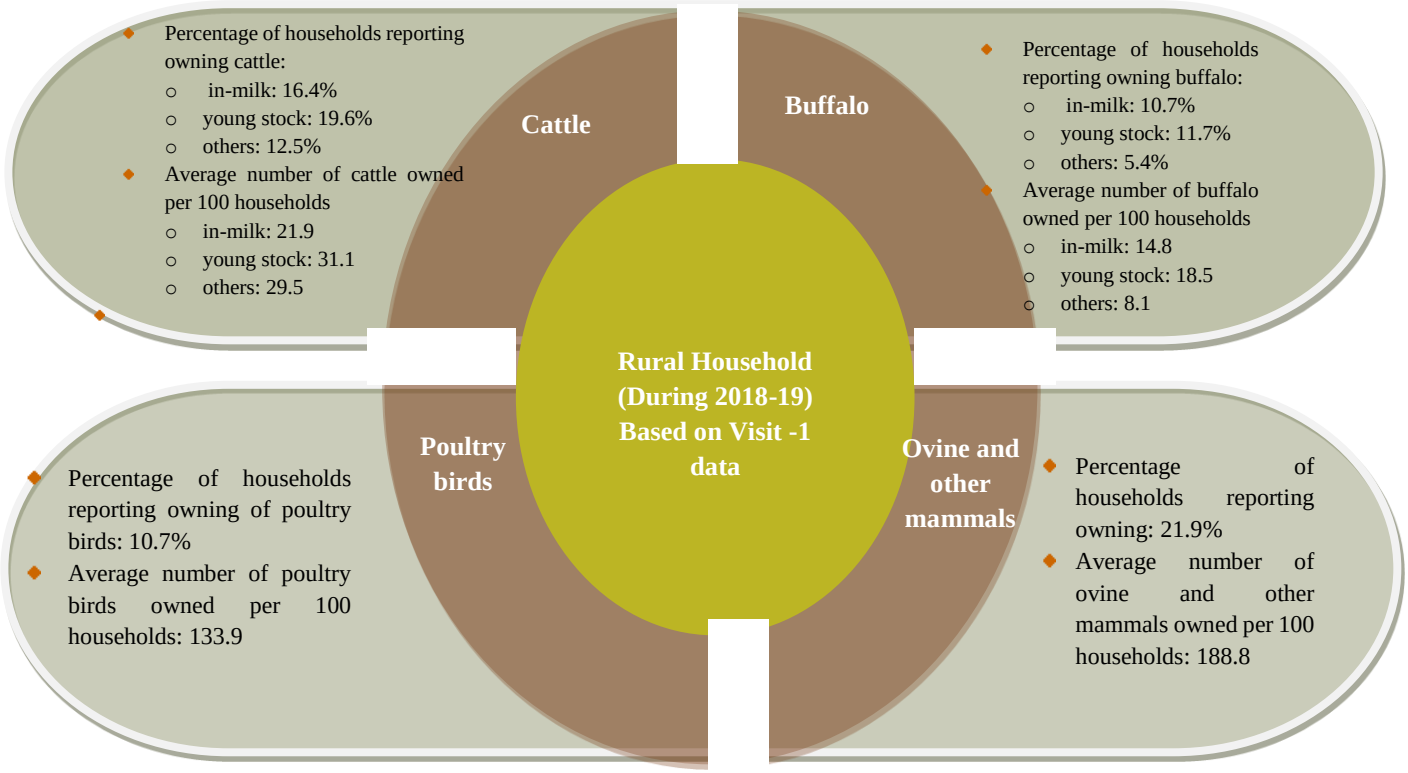
H. Household Operational Holdings of Land During 2018-19



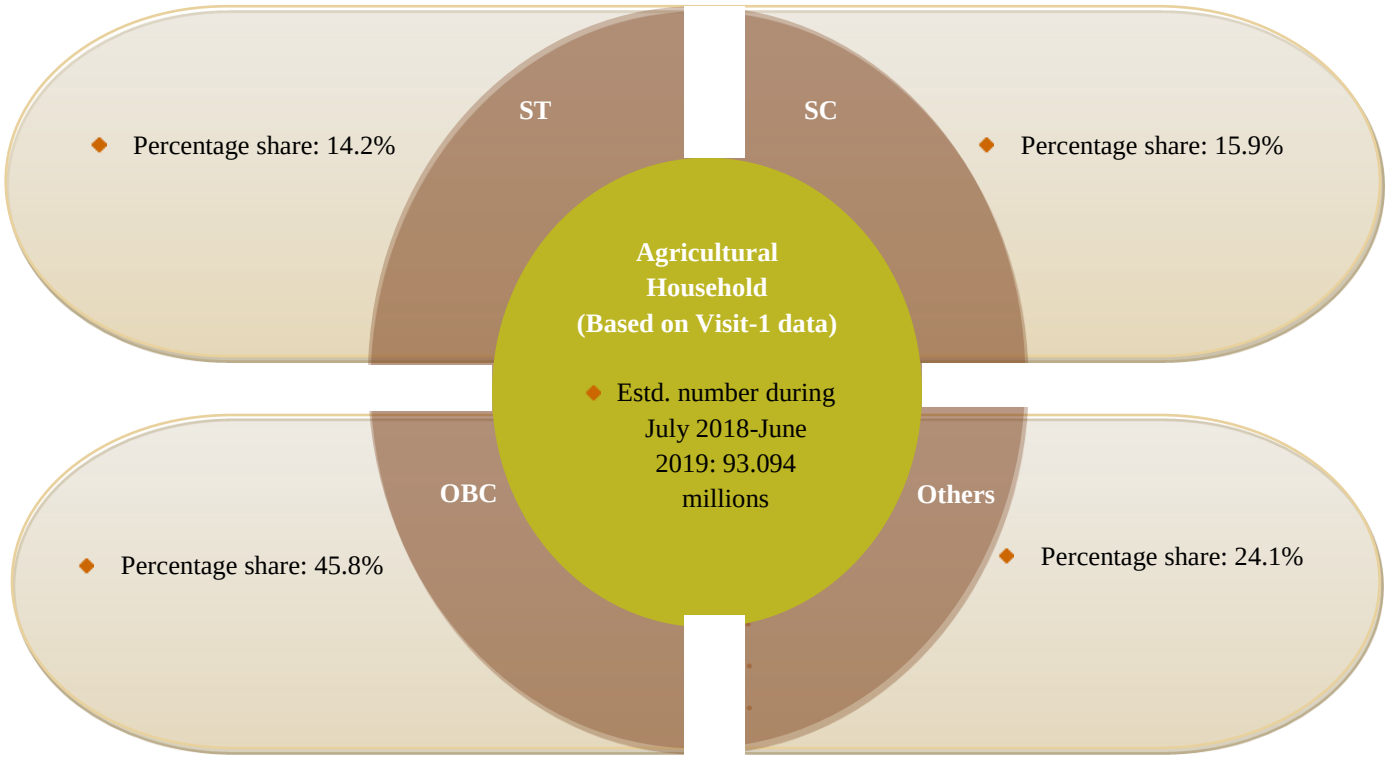
I. Distribution of Land Possessed by Type of Land Use During 2018-19



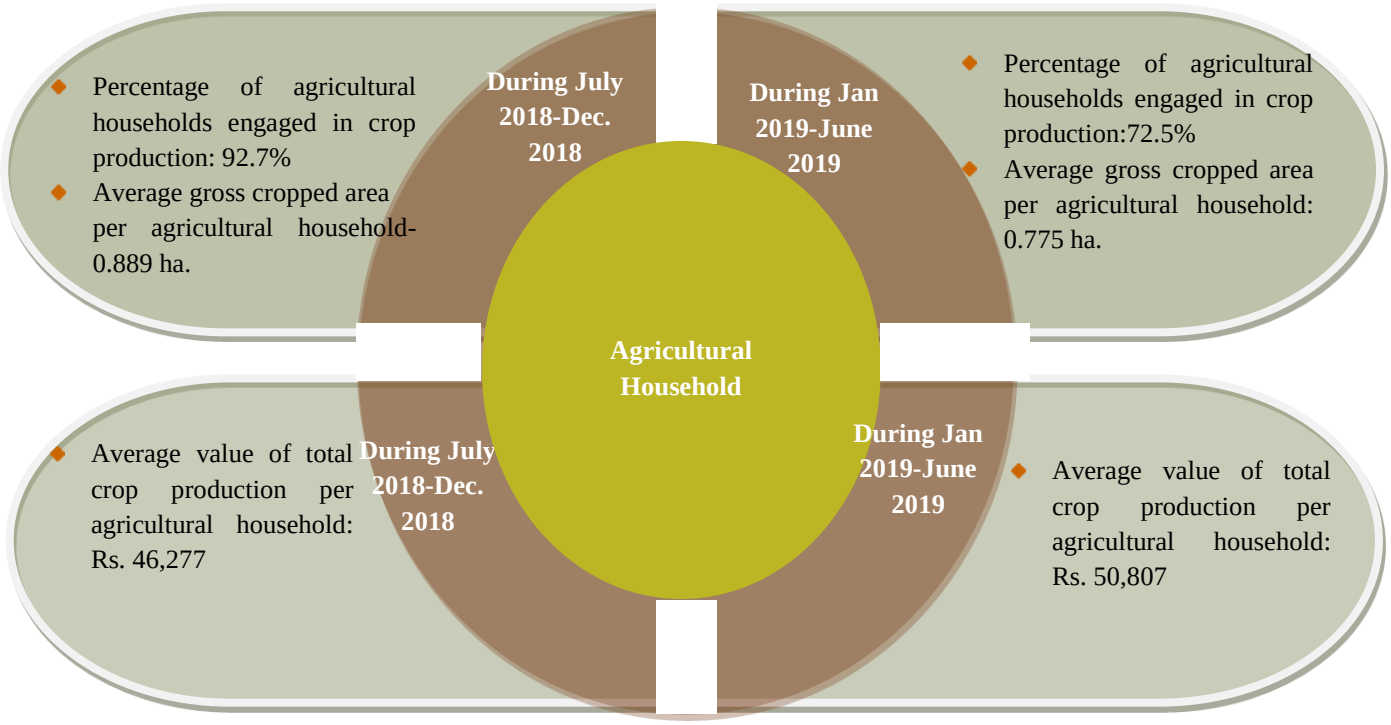
J. Ownership of Livestock



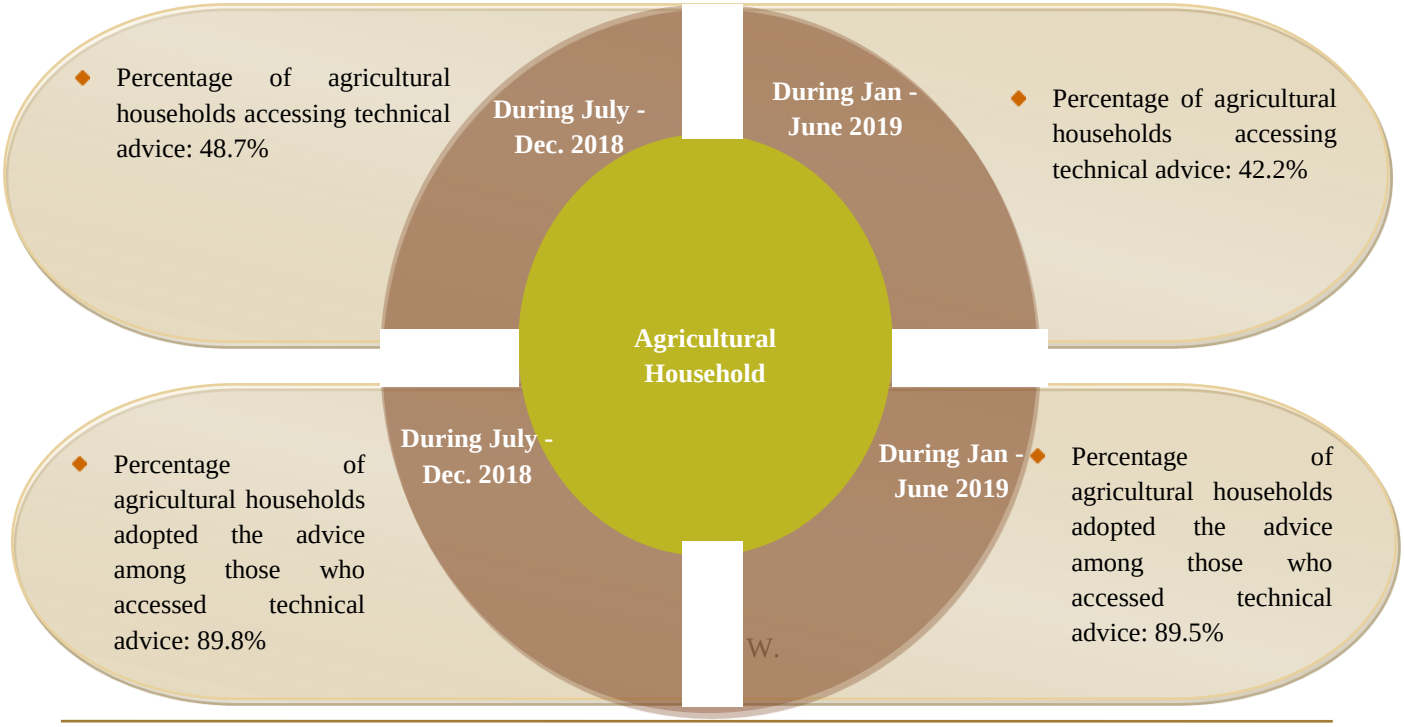
K. Distribution of Agricultural Households by Social Group



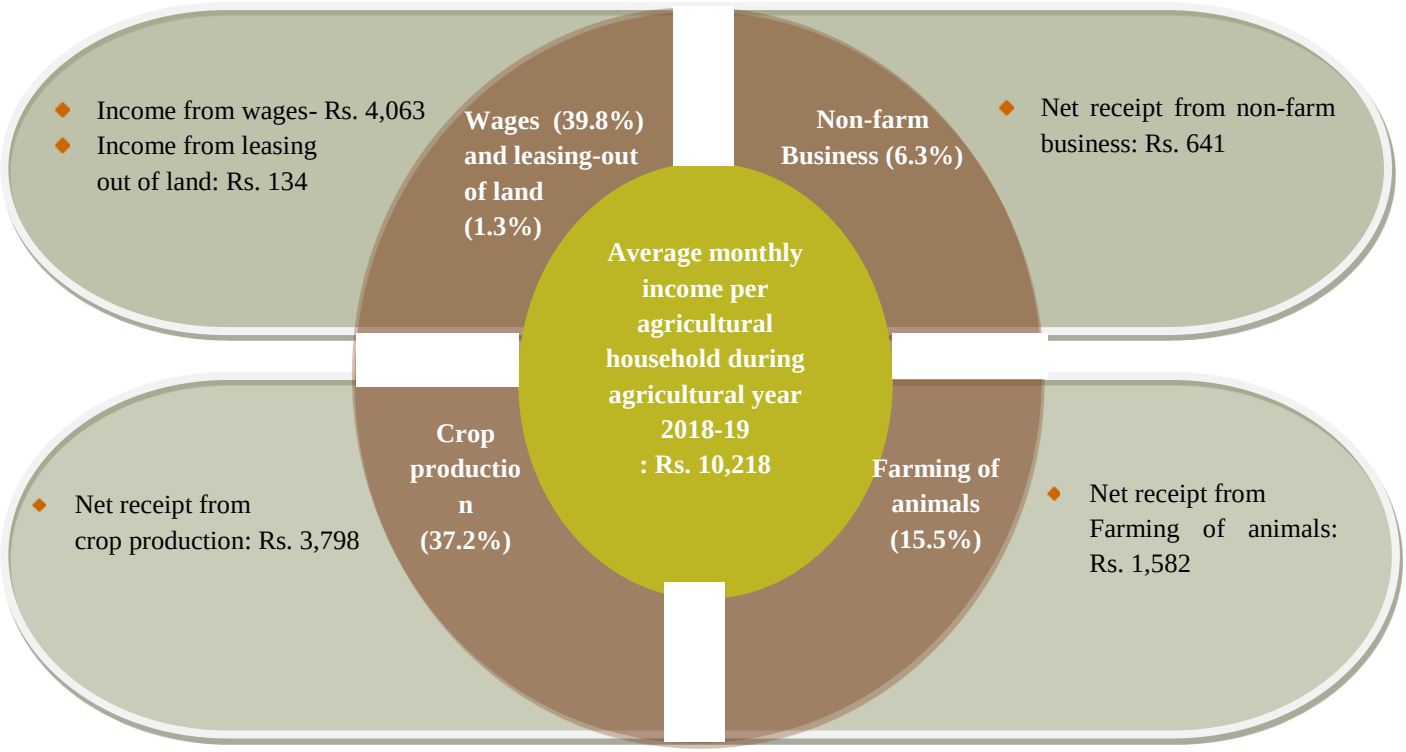
L. Agricultural Households Engaged in Crop Production



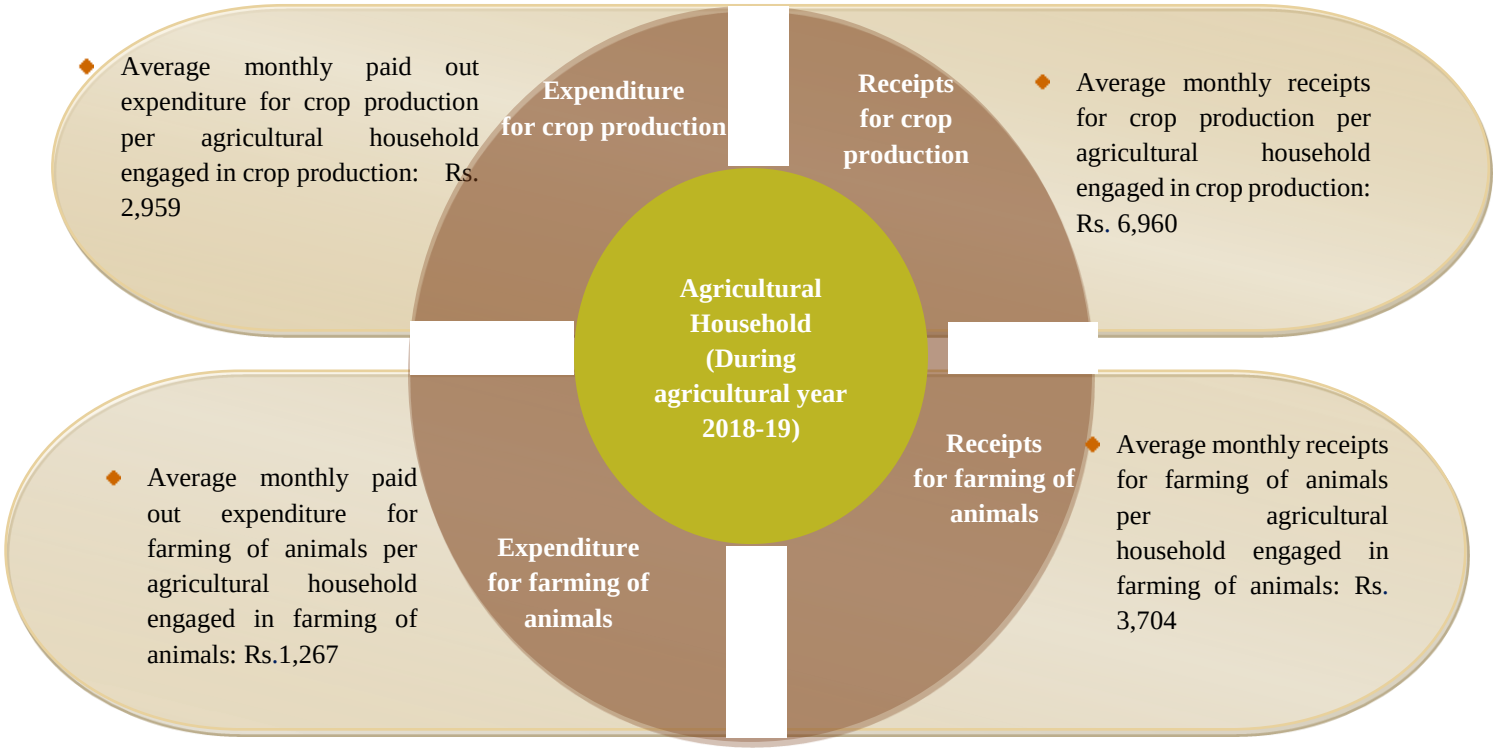
M. Access to Different Facilities/ Schemes/Technical Advice by Agricultural Households



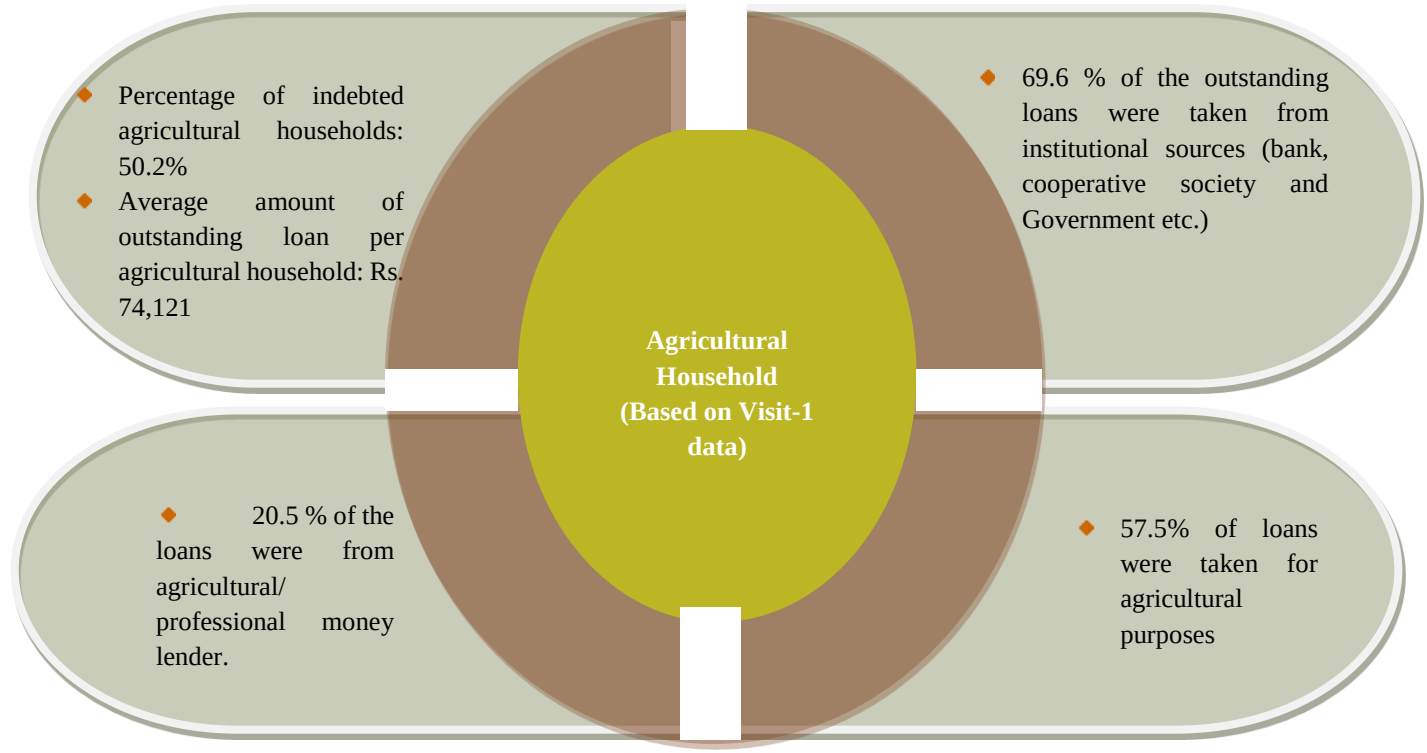
N. Average Monthly Income per Agricultural Household



O. Average Monthly Paid-out Expenditure and Receipts for Crop Production and Farming of Animals per Agricultural Households



P. Indebtedness of Agricultural Households



Highlights II- All India Debt & Investment (AIDIS) Survey: NSS 77th Round (January to December, 2019)

- The National Statistical Office (NSO) conducts All India Debt & Investment (AIDIS) survey in the rural and urban areas of the country at periodic intervals.
- The current survey, latest in the AIDIS series, was conducted during the period January to December, 2019.
- Information in the survey was collected in two visits (Visit 1: January-August, 2019 and Visit 2: September - December, 2019) from the same set of sample households.
- The reference date/period to collect the information on assets and liabilities was 30.06.2018 and it was 01.07.2018 to 30.06.2019 for capital formation.
- The survey was spread over 5,940 villages covering 69,455 households in the rural sector and 3,995 blocks covering 47,006 households in the urban sector.

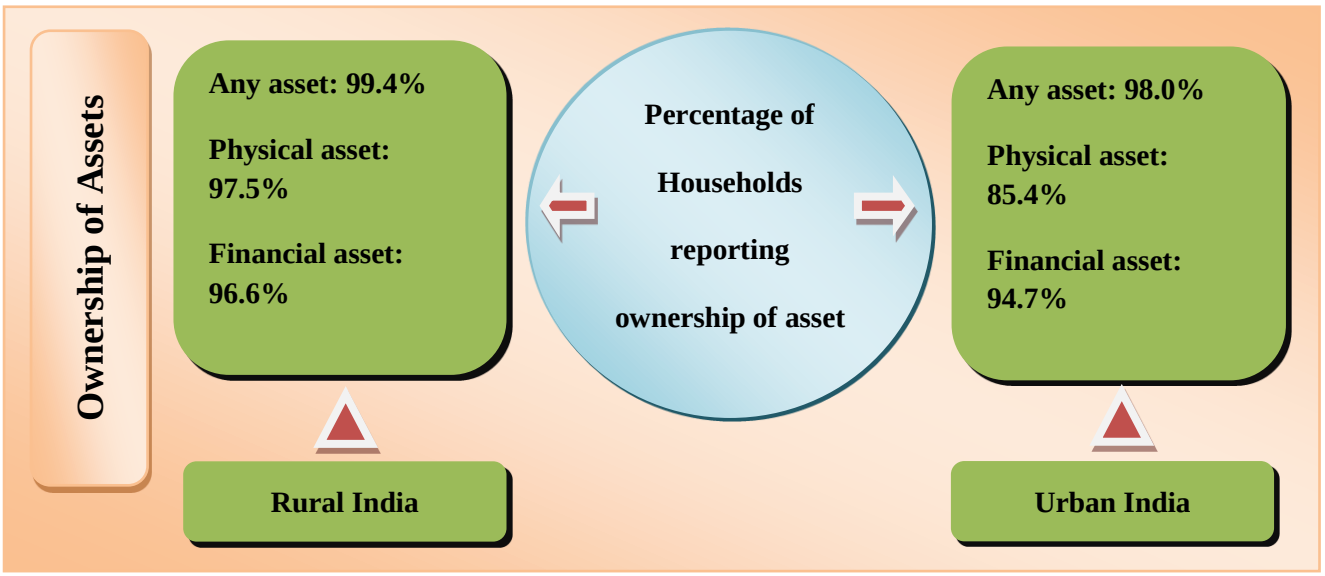
Indicators compiled

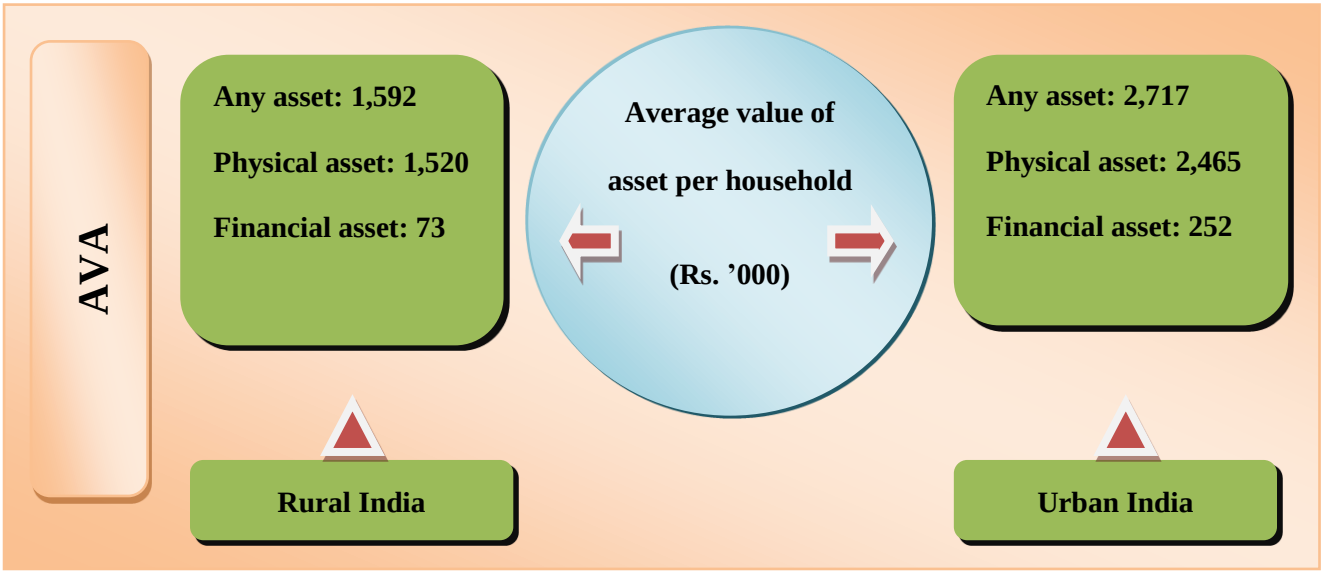
The following indicators were generated from the survey of All India Debt & Investment:

- Average value of Assets (AVA): The average value of all the physical and financial assets owned per household as on 30.06.2018.
- Incidence of Indebtedness (IOI): The percentage of the indebted households as on 30.06.2018.
- Average amount of Debt (AOD): The average amount of cash dues as on 30.06.2018 per household.
- Debt-Asset Ratio (DAR): The average amount of debt (AOD) outstanding on a given date for a group of households expressed as a percentage of the average amount of assets (AVA) owned by them on that given date.

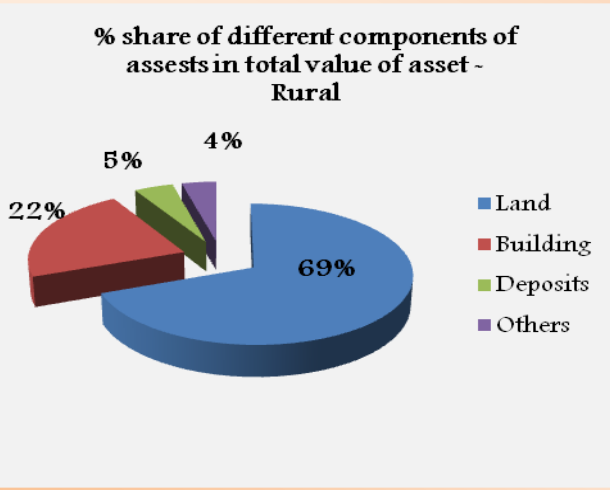
A. Assets

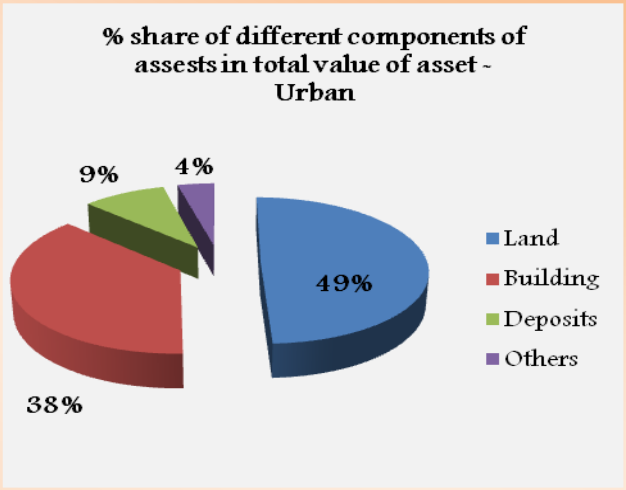
A1. Ownership of Assets& Average value of Assets





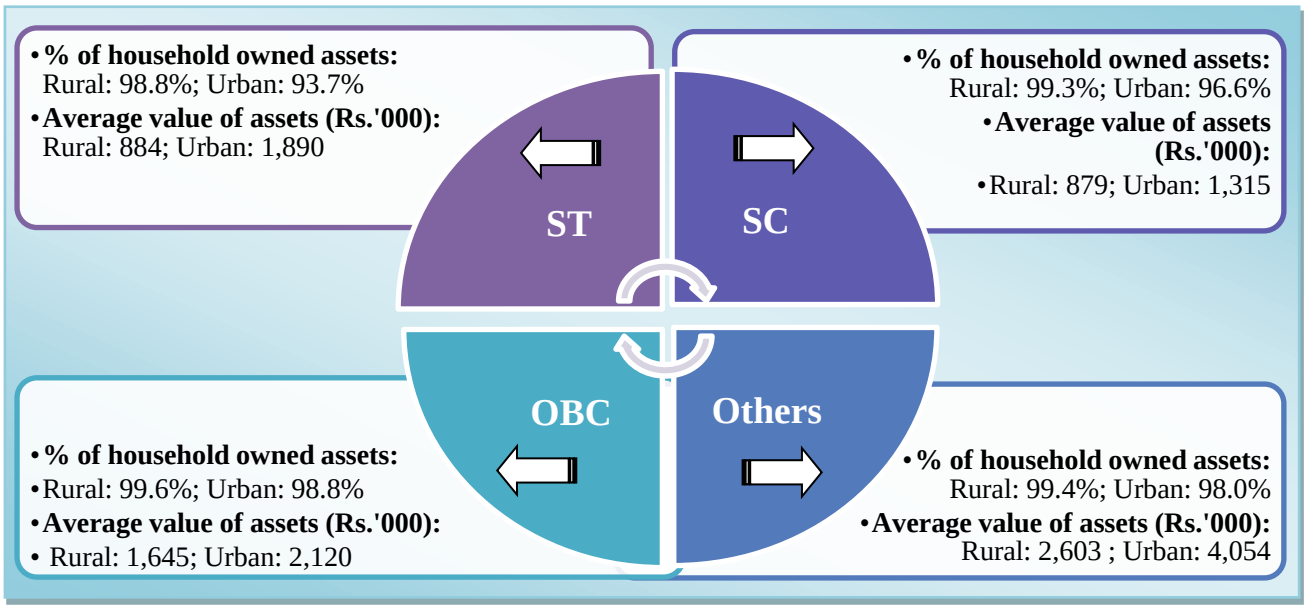
A2. Percentage share of different components of assets in total value of assets



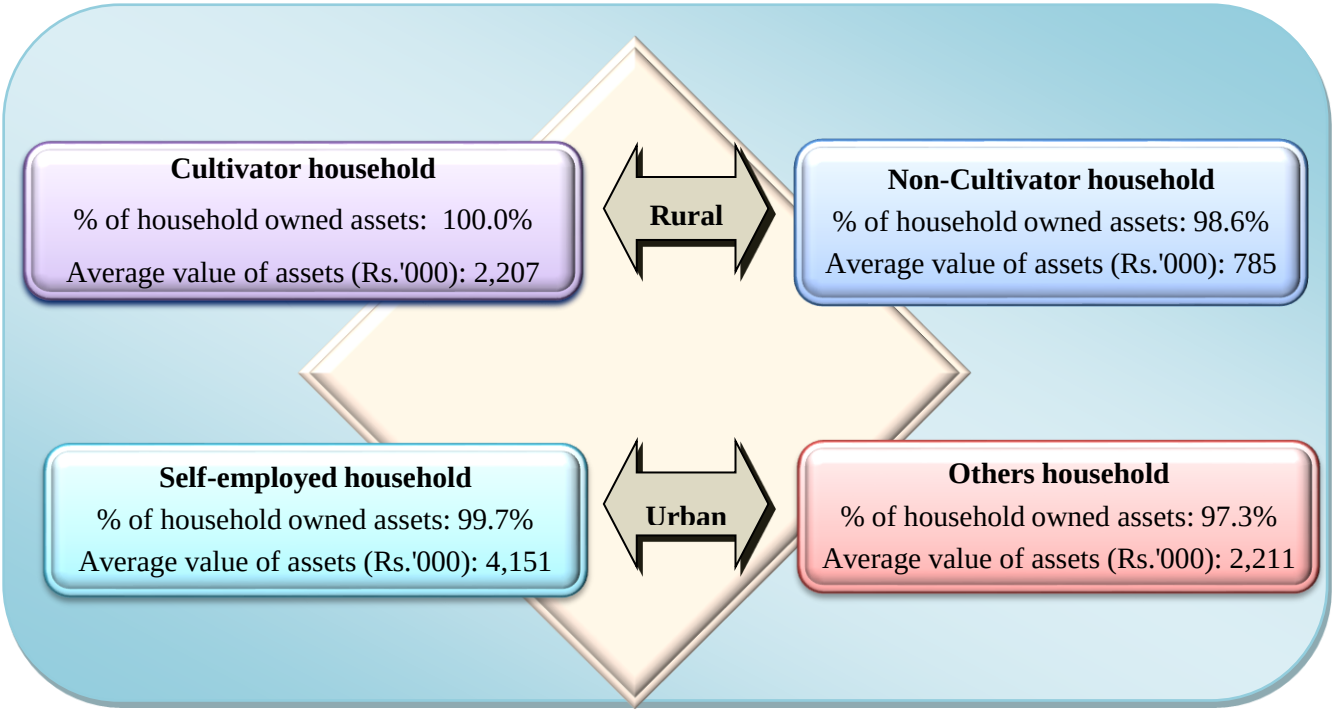


Note: Other assets include livestock, transport equipments, agricultural machinery, non-farm business equipment and shares.

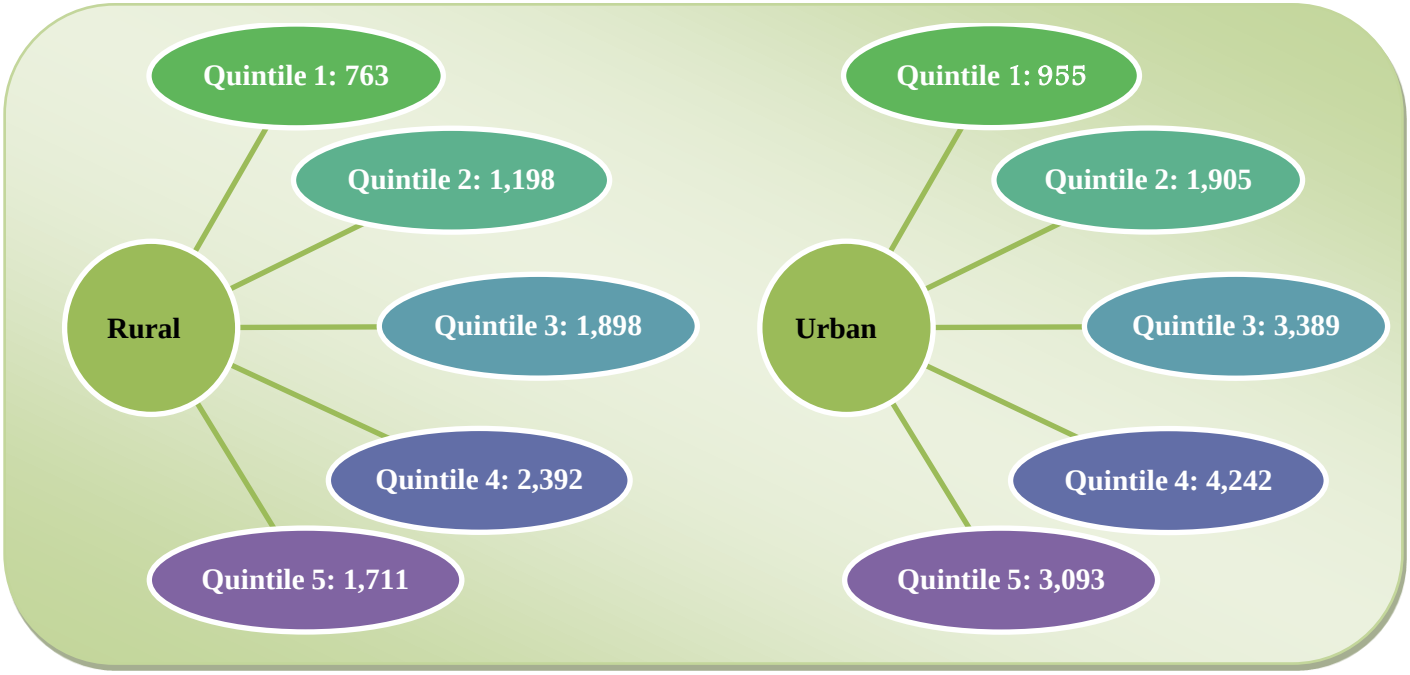
A3. Assets owned by the household and AVA by Social



A4. Assets owned by the household and AVA by occupational category of the household



A5. AVA (Rs. '000) by quintile class of household consumer expenditure



B. INDEBTEDNESS

B1. Incidence of Indebtedness (IOI)and Average amount of Debt (AOD)

IOI

35%

RURAL INDIA

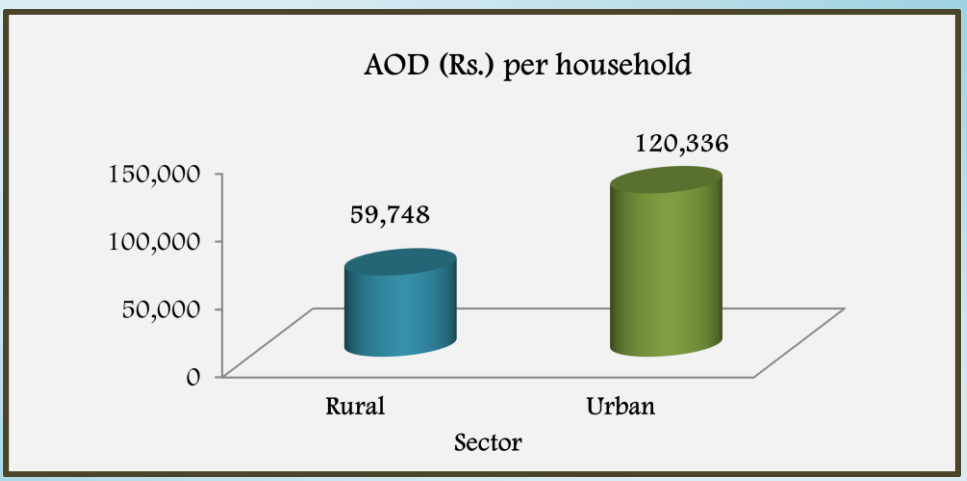
Percentage of Indebted Households

22%

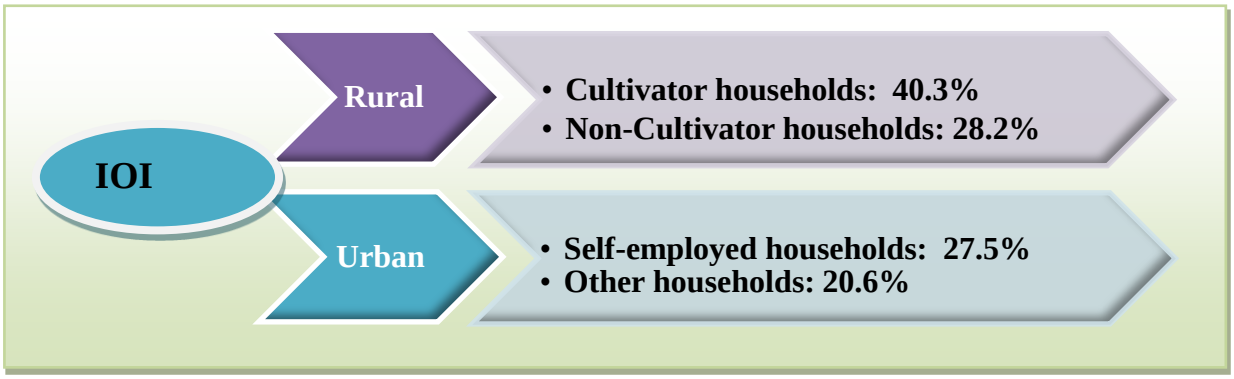
URBAN INDIA

Indebted households:Households having cash loan outstanding

AOD



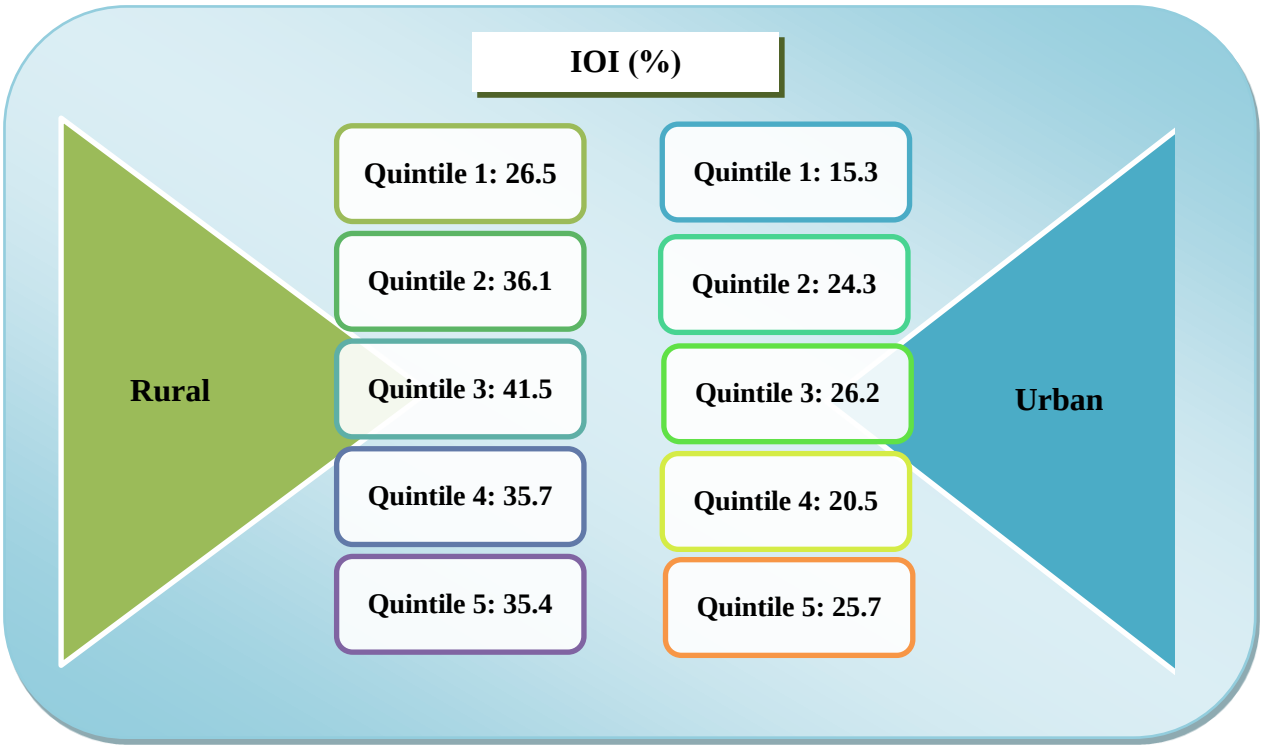
B2. Incidence of Indebtedness (IOI) by occupational category of household



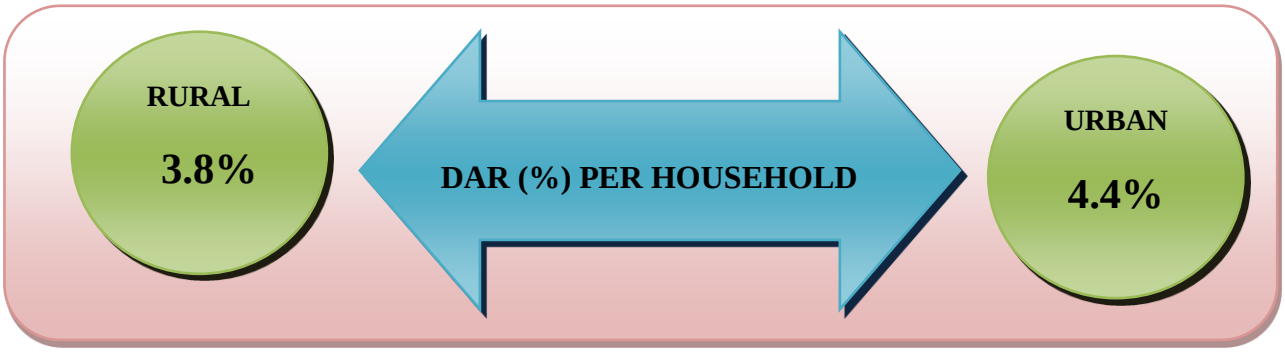
B3. Incidence of Indebtedness (IOI): INTER STATE VARIATION

IOI(%)	States/UTs- Rural	States/UTs-Urban
>35%	Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Odisha, Punjab, Rajasthan, Tamil Nadu, Puducherry, Telangana	Andhra Pradesh, Kerala
>=10% &<=35%	Arunachal Pradesh, Assam, Bihar, Chattishgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Maharashtra, Manipur, Mizoram, Sikkim, Tripura, Uttarakhand, Uttar Pradesh, West Bengal, A & N Islands, Chandigarh	Arunachal Pradesh, Assam, Bihar, Chattishgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Maharashtra, Madhya Pradesh, Karnataka, Manipur, Mizoram, Nagaland, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttarakhand, Uttar Pradesh, West Bengal, A & N Islands, Odisha, Lakshadweep, Puducherry, Dadra
<10%	Delhi, Meghalaya, Nagaland, Daman & Diu, Lakshadweep, Dadra & Nagar Haveli	Delhi, Meghalaya, Chandigarh, Daman & Diu

B4. IOI (%) by quintile class of household consumer



B5. Debt-Asset Ratio (DAR)



खण्ड-III हिंदी

सर्वेक्षण

राष्ट्रीय सांख्यिकी कार्यालय की पत्रिका

भाग- PDOS-XXXVII सं० 3 और 4
अंक संख्या 112वां
मार्च, 2022

राष्ट्रीय सांख्यिकी कार्यालय
सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय
भारत सरकार
नई दिल्ली

सम्पादकीय सचिवालय – सर्वेक्षण समन्वय प्रभाग,राष्ट्रीय सांख्यिकी कार्यालय, सांख्यिकी एवं कार्यक्रम कार्यान्वयन मंत्रालय, संख्यिकी भवन, महर्षि वाल्मीकि मार्ग, नईदिल्ली-110032

1. श्रीमती प्रवीन होरो सिंह, अपर महानिदेशक, एनएसओ (एस.सी.डी)
2. सुश्री नौशीदा एन. ए., निदेशक, एनएसओ (एस.सी.डी)
3. श्री चेतन यंगजोर, उप निदेशक, एनएसओ (एस.सी.डी)
4. श्री राम प्रकाश, वरिष्ठ सांख्यिकी अधिकारी, एनएसओ (एस.सी.डी)

सर्वेक्षण

भाग- PDOS-XXXVII सं॰ 3 और 4

एनएसओ द्वारा जारी की गई रिपोर्ट की मुख्य बातें

(मुख्य बातें एनएसओ के एस.डी.आर.डी. प्रभाग द्वारा तैयार की गई सम्बंधित रिपोर्ट से उद्धृत की गई हैं। विवरण के लिए पाठक सम्बंधित मुख्य रिपोर्ट देख सकते हैं)

मुख्य बातें-I: ग्रामीण भारत में कृषक परिवारों की स्थिति और परिवारों की भूमि एवं पशुधन धृतियों का मूल्यांकन: एनएसएस 77वां दौर (जनवरी से दिसम्बर, 2019)

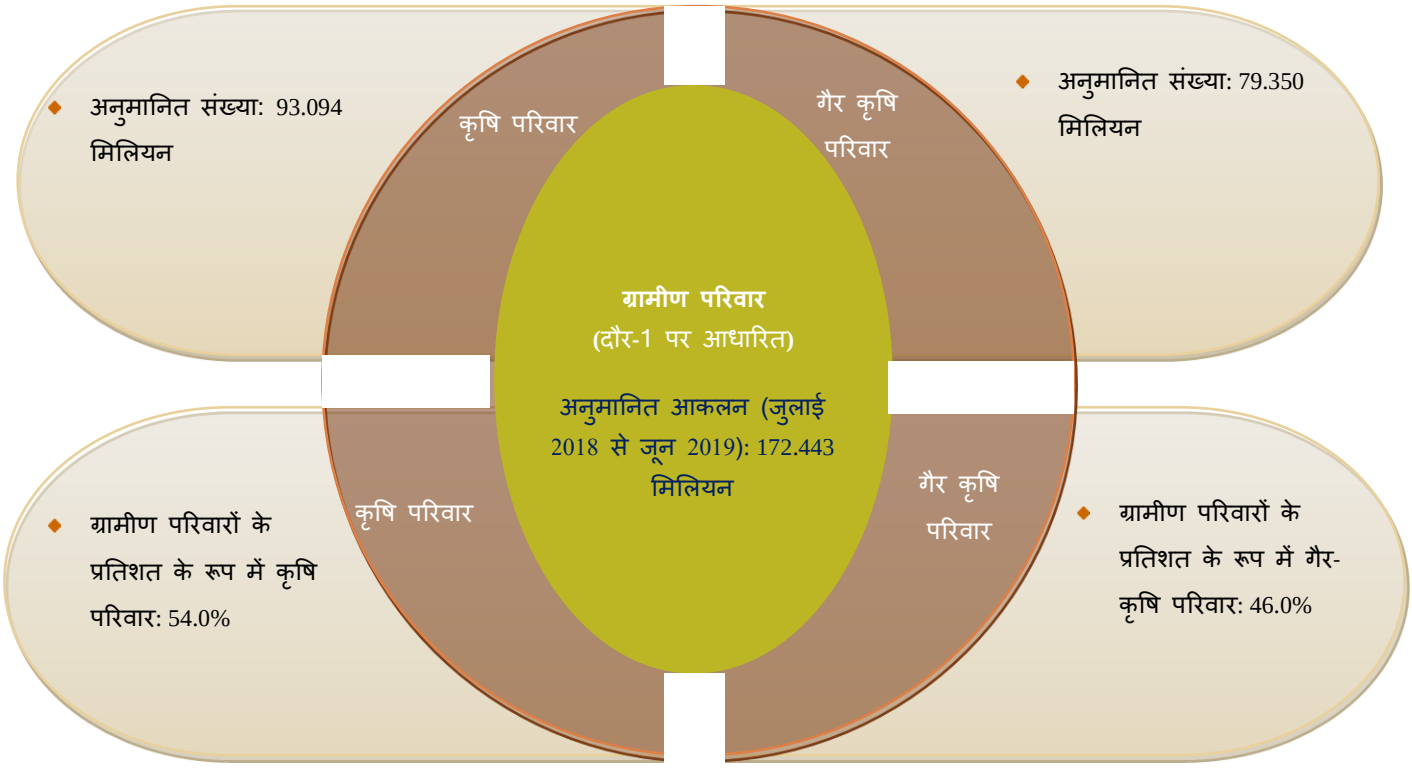
सर्वेक्षण अवधि

- राष्ट्रीय सांख्यिकीय कार्यालय (रासाका) ने एक एकीकृत अनुसूची पर सम्पूर्ण देश के ग्रामीण क्षेत्रों में भूमि एवं पशुधन धारित परिवारों एवं कृषि परिवारों की स्थिति निर्धारण पर एक सर्वेक्षण चलाया ।
- यह सर्वेक्षण जनवरी 2019 से दिसम्बर 2019 के दौरान चलाया गया ।
- कृषि वर्ष 2018-19 के दो दौरों (दौर -1 में जुलाई-दिसम्बर 2018 के सूचना एकत्रित किया गया एवं दौर-2 में जनवरी-जून 2019 के सूचना एकत्रित किया गया) में मूलत: सूचना एकत्रित किया गया एवं दो दौरों में उन्हीं प्रतिदर्श परिवारों से सूचना एकत्रित किया गया।

सर्वेक्षण की व्याप्ति

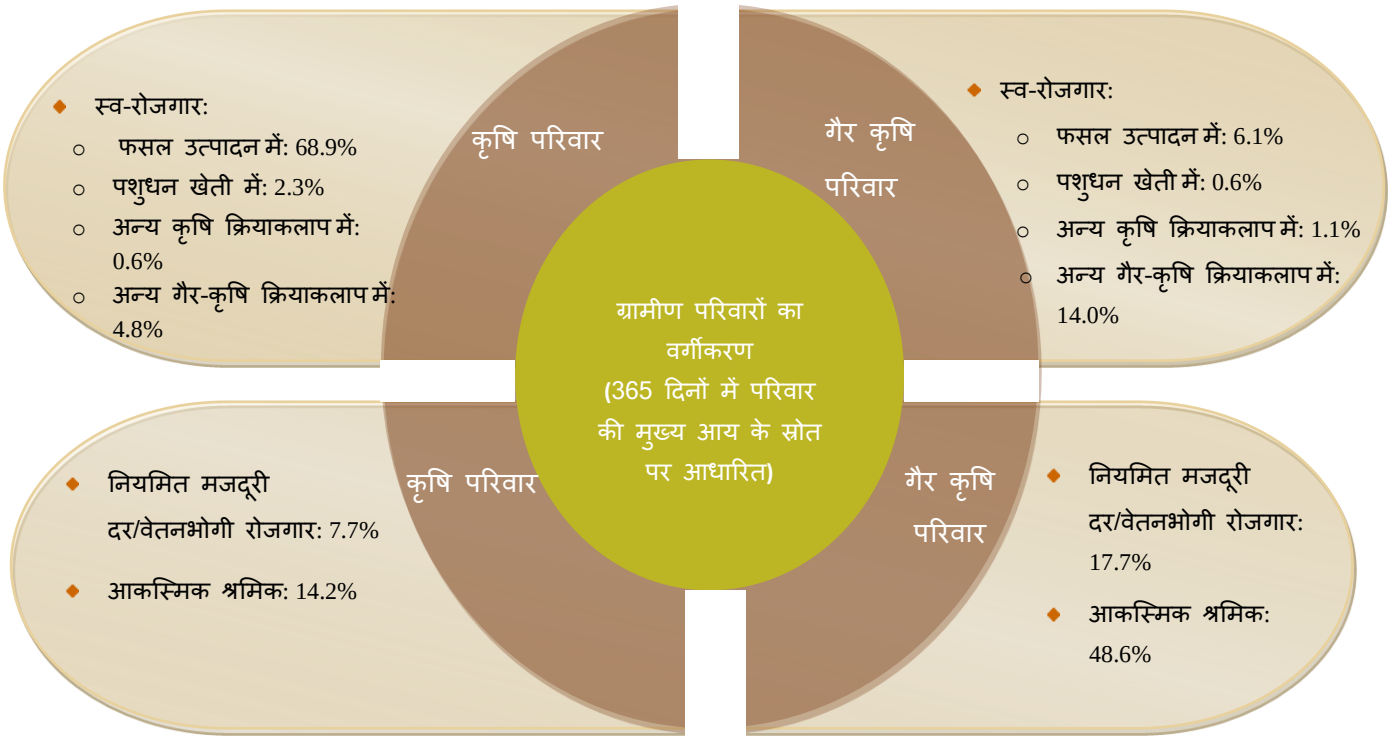
- ग्रामीण क्षेत्रों में दौर-1 में 58,035 परिवारों को मिलाकर 5,940 प्रथम चरण ईकाईयां सर्वेक्षित की गई एवं दौर-2 में 56,894 परिवारों को मिलाकर 5,894 प्रथम चरण ईकाईयां सर्वेक्षित की गई।
- यह सर्वेक्षण पूरे ग्रामीण भारत में फैला था सिवाय अण्डामान एवं निकोबार द्वीप समूह के ग्रामों के जो कि पहुंच के बाहर है ।

A. ग्रामीण परिवारों की आकलित संख्या

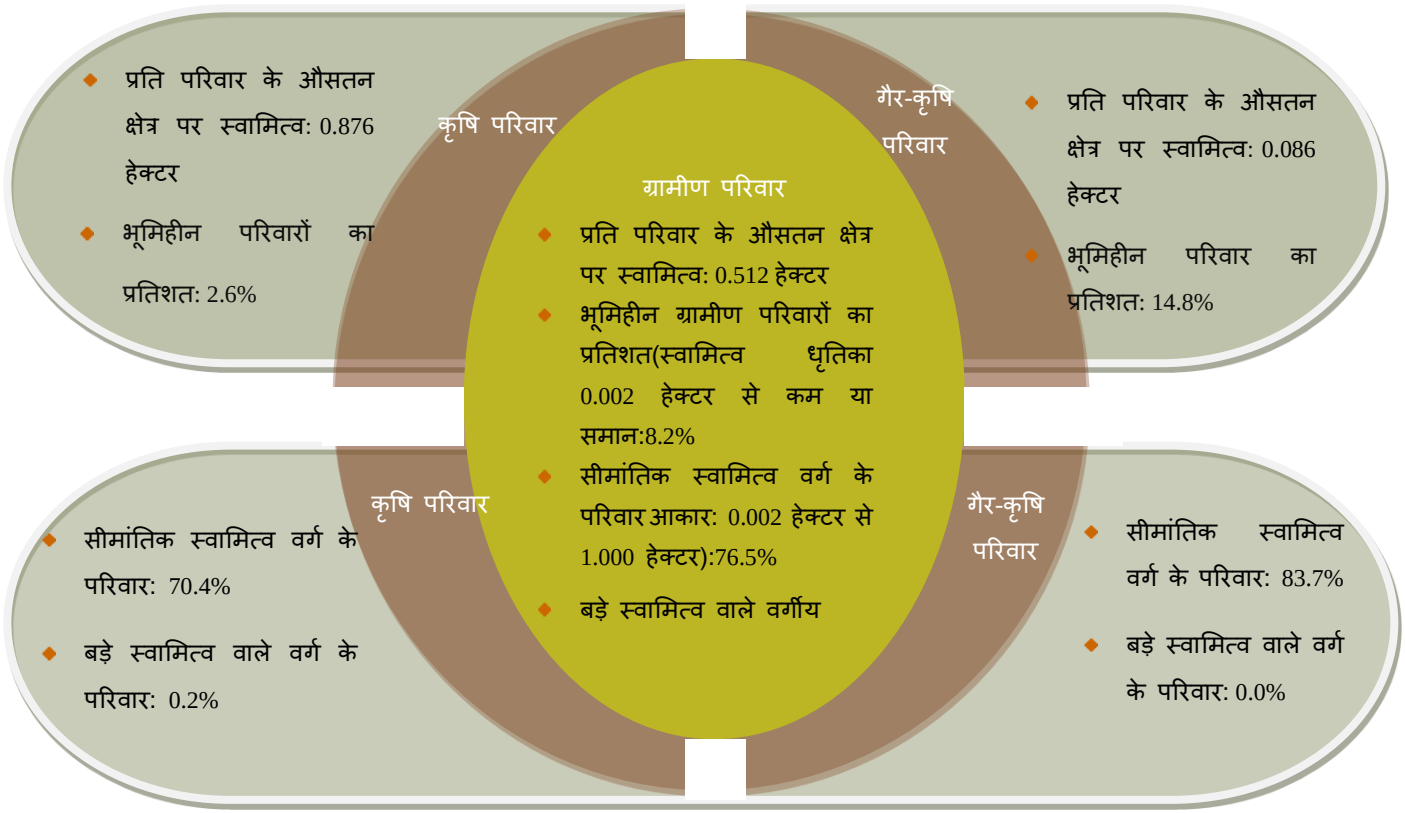


B. ग्रामीण परिवारों द्वारा धारित भूमि

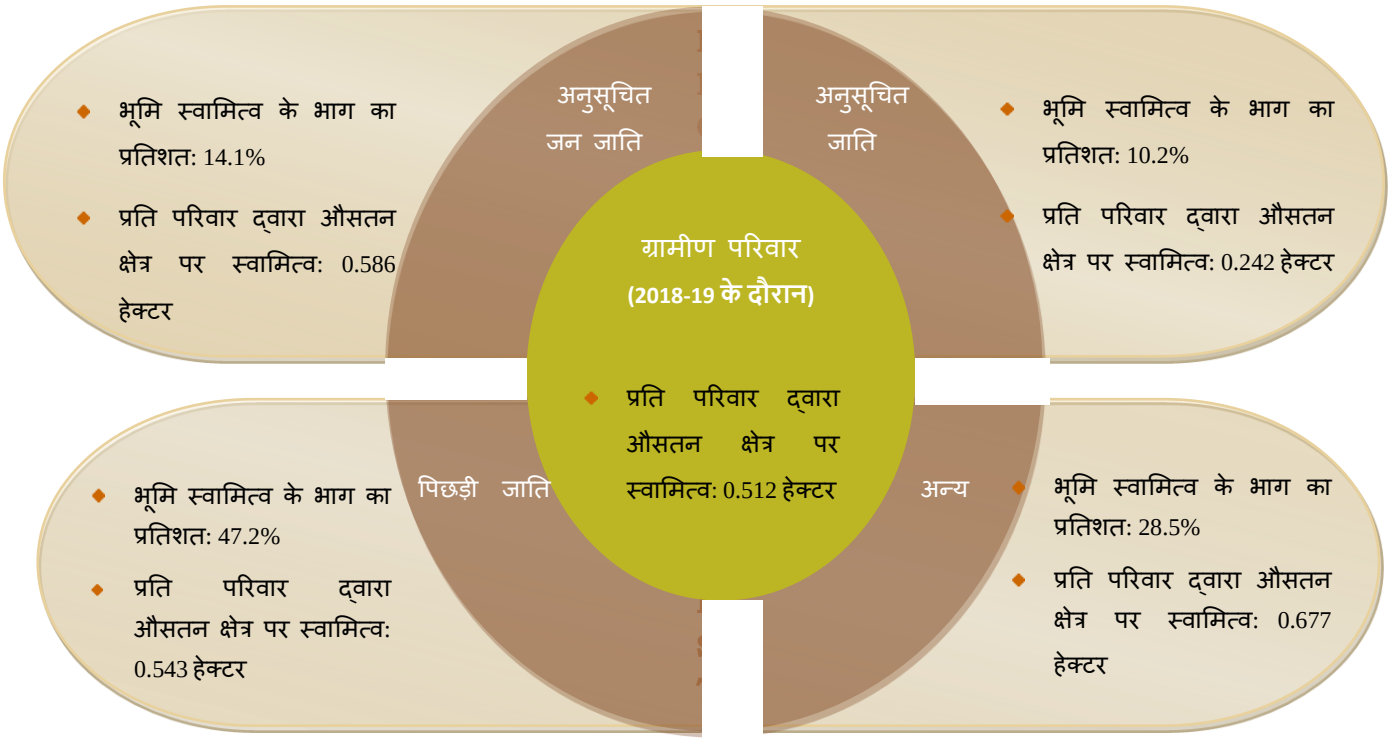
C. परिवार वर्गीकरण



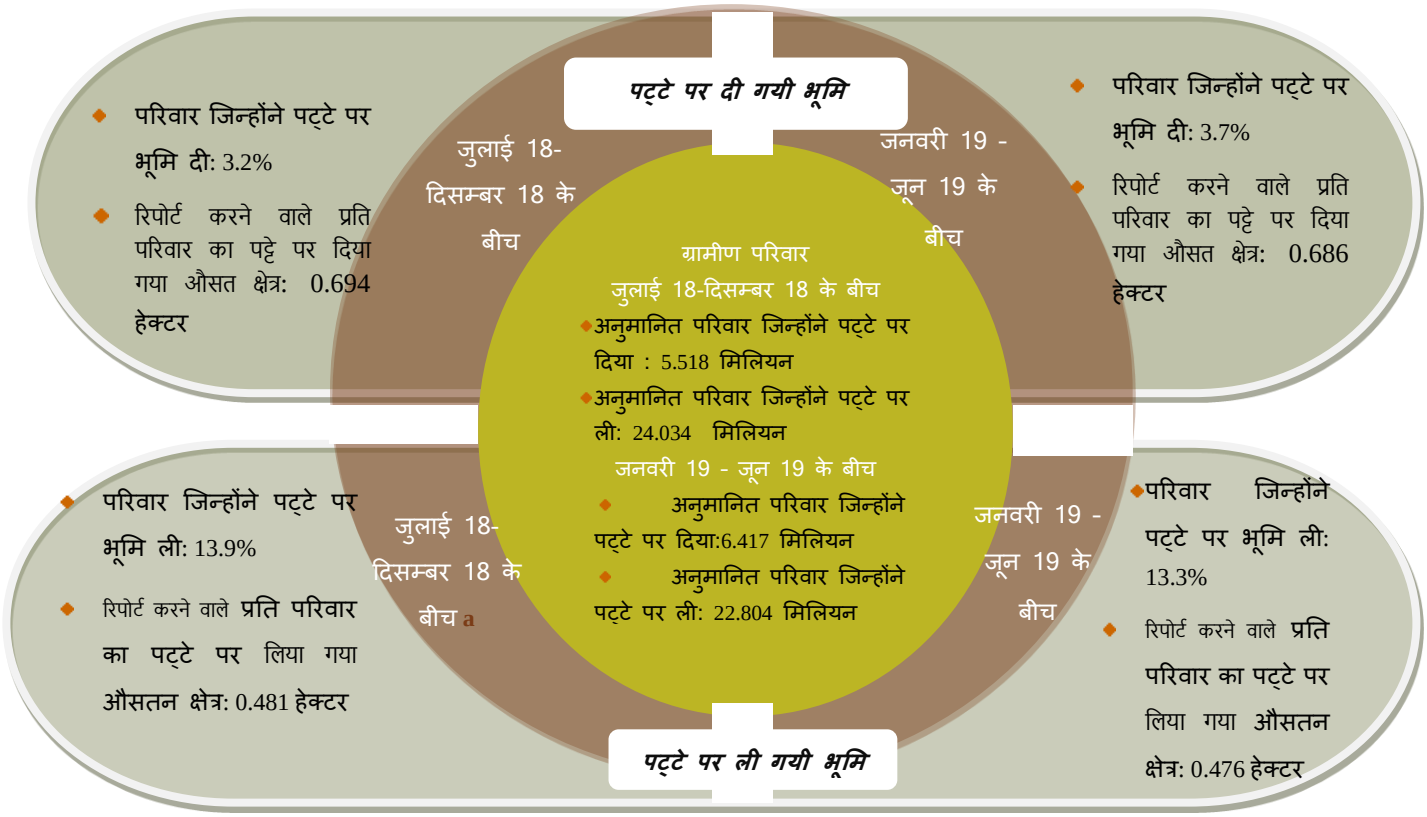
D. 2018-19 के बीच भूमि धृतियों के पारिवारिक स्वामित्व



E. 2018-19 के बीच सामाजिक वर्ग द्वारा भूमि की धृतियों पर पारिवारिक स्वामित्व

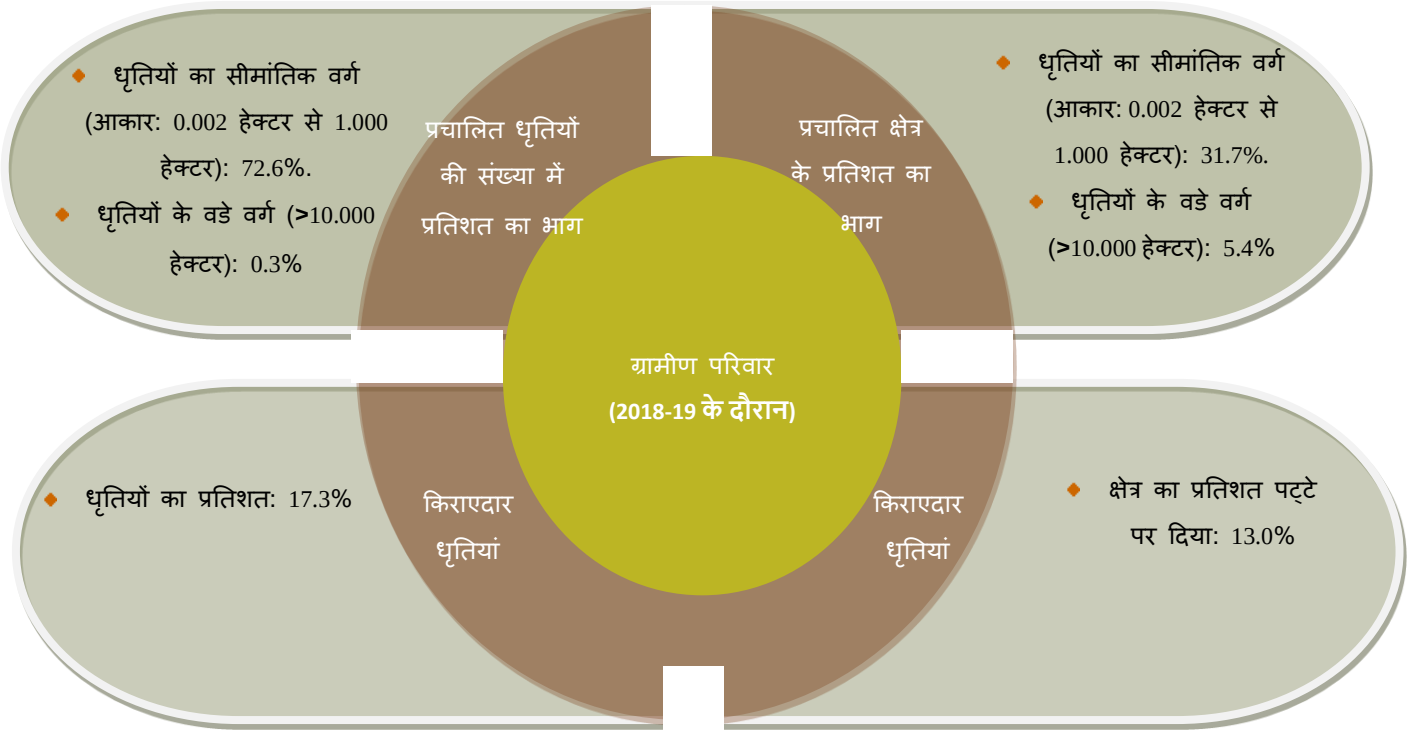


F. पट्टे पर दी गयी एवं पट्टे पर ली गयी भूमि



G. 2018-2019 के वीच परिवारों की भूमि का प्रचालन धृतियां

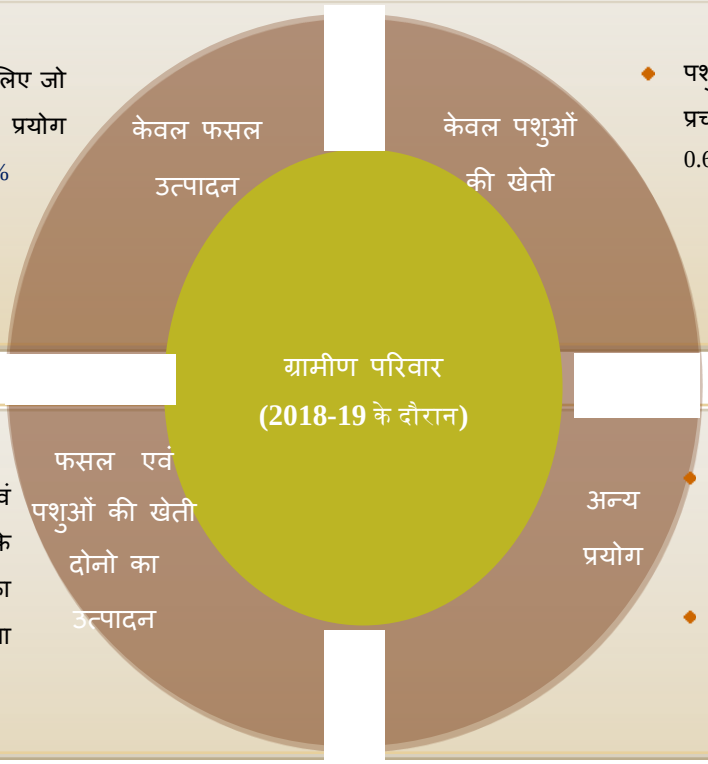
H. 2018-2019 के वीच भूमि की प्रचलात्मक धृतियां



I. 2018-2019 के वीच भूमि की प्रकार के उपयोग पर ग्रामीण परिवारों द्वारा धारित भूमि का वितरण

- फसलों के उत्पादन के लिए जो भूमि क्षेत्र का प्रतिशत प्रयोग किया गया वह : 84.0%

- पशुओं की खेती के लिए प्रचालित क्षेत्र का प्रतिशत : 0.6%



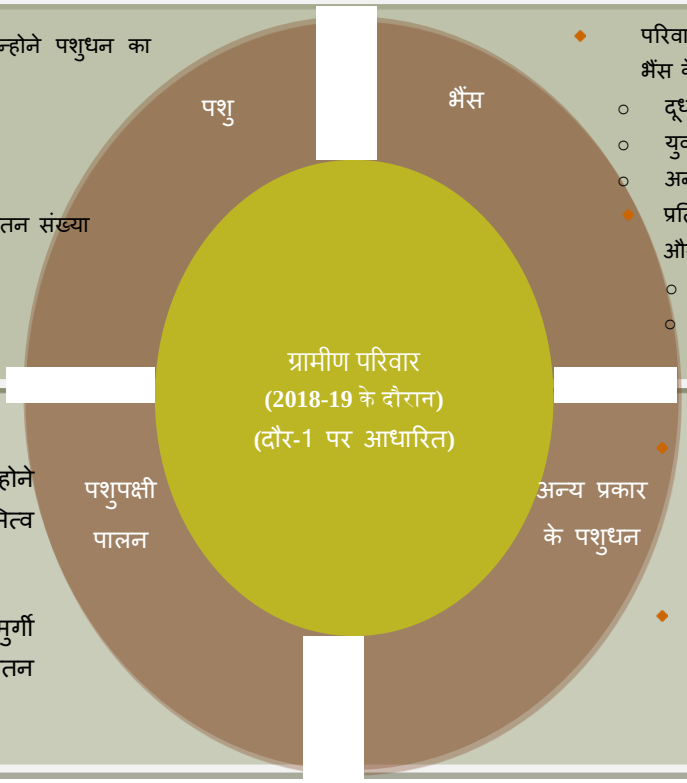
- फसलों का उत्पादन एवं पशुओं की खेती दोनो के लिए जो भूमि क्षेत्र का प्रतिशत प्रयोग किया गया वह: 6.0%

- अन्य कृषि उद्देश्य के व्यवहार के लिए भूमि का प्रतिशत: 0.7%
- अन्य गैर-कृषि उद्देश्य के व्यवहार के लिए भूमि का प्रतिशत: 8.7%

J. पशुधन का स्वामित्व

- परिवारों का प्रतिशत जिन्होने पशुधन का स्वामित्व दर्ज किया है:
  - दूध में: 16.4%
  - युवा स्टॉक: 19.6%
  - अन्य: 12.5%
- प्रति 100 परिवारों के औसतन संख्या
  - दूध में: 21.9
  - युवा स्टॉक: 31.1
  - अन्य: 29.5

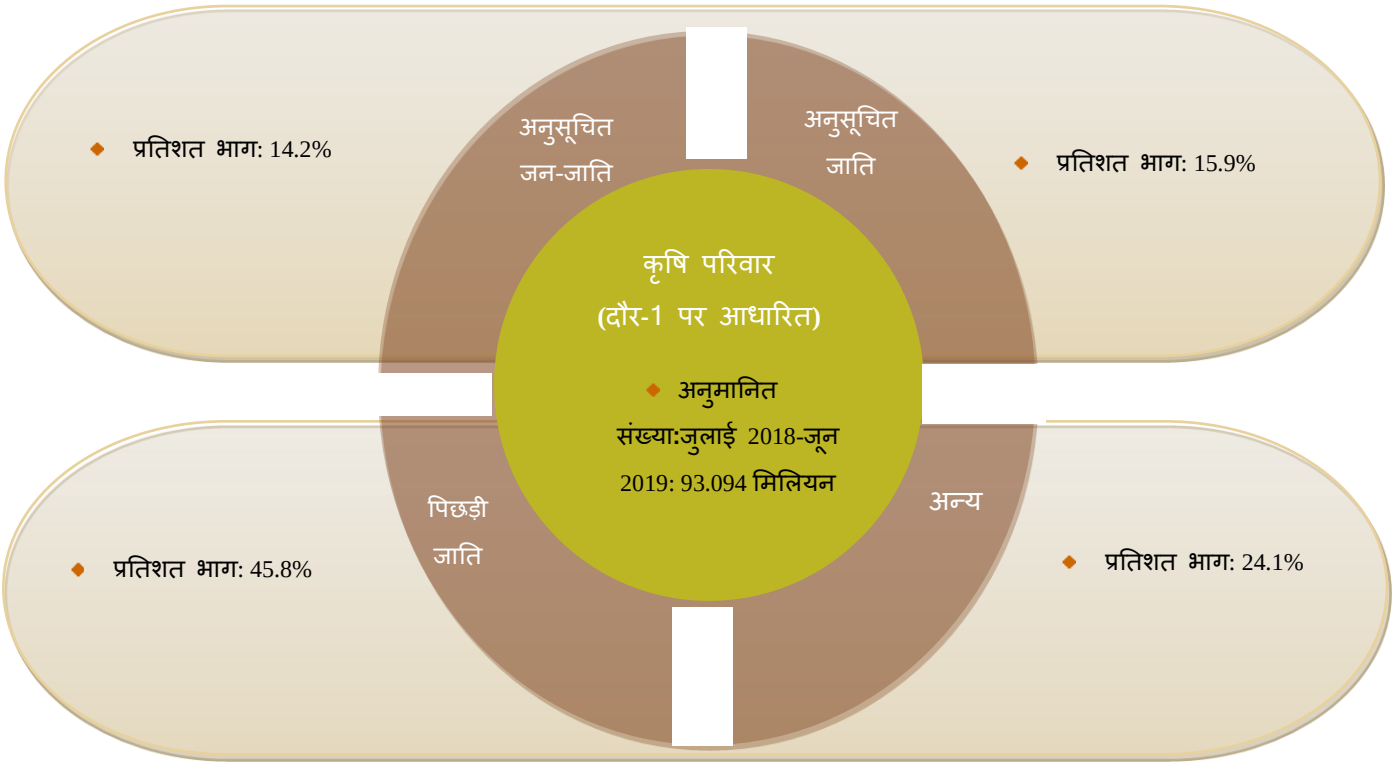
- परिवारों का प्रतिशत जिन्होने भैंस के स्वामित्व दर्ज किया है:
  - दूध में: 10.7%
  - युवा स्टॉक: 11.7%
  - अन्य: 5.4%
- प्रति 100 परिवारों के औसतन संख्या
  - दूध में: 14.8
  - युवा स्टॉक: 18.5



- उन परिवारों का प्रतिशत जिन्होने पशु-पक्षी/मुर्गी पालन का स्वामित्व दर्ज किया था : 10.7%
- प्रति 100 परिवारों के पशु-पक्षी/मुर्गी पालन का स्वामित्व का औसतन संख्या :133.9

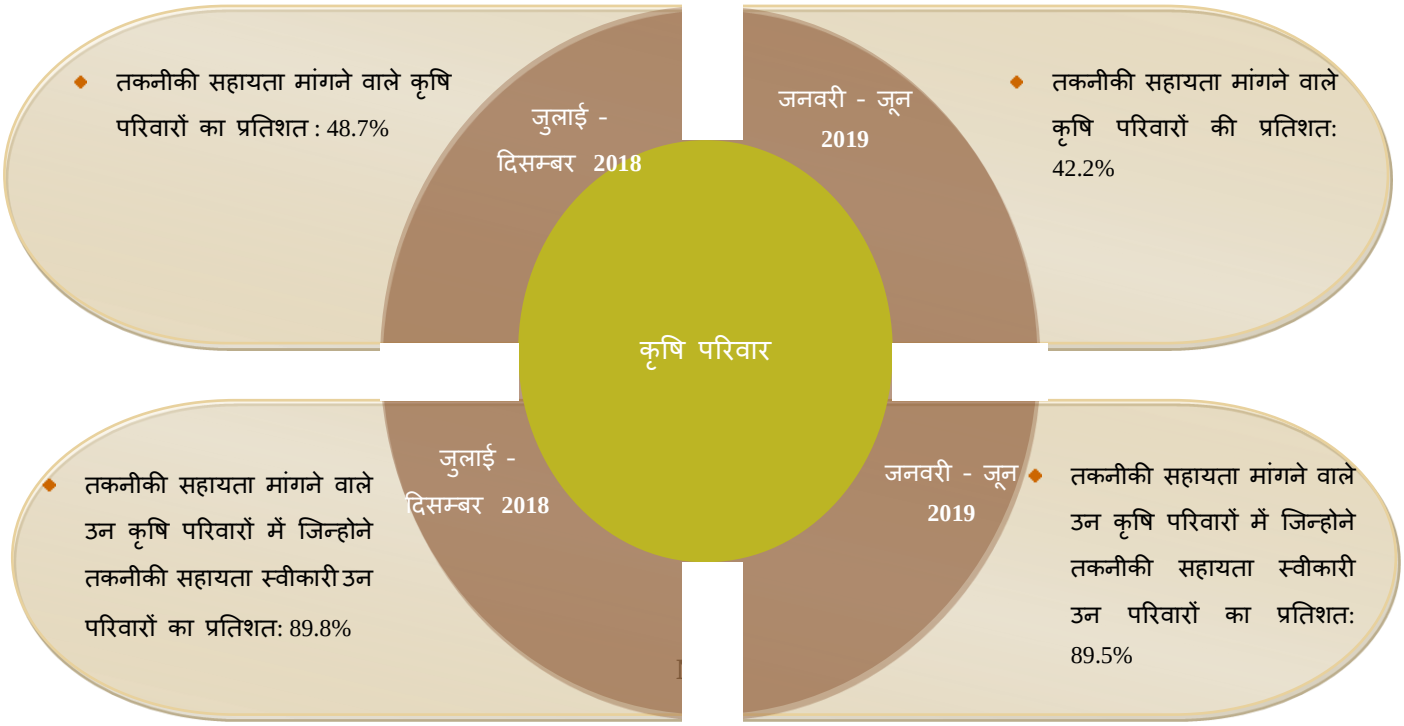
- उन परिवारों का प्रतिशत जिन्होने अन्य प्रकार के पशुधन पालन का स्वामित्व दर्ज किया था : 21.9%
- प्रति 100 परिवारों के अन्य प्रकार के पशुधन पालन का स्वामित्व का औसतन संख्या: 188.8

K. विभिन्न सामाजिक वर्गों में कृषि परिवारों का प्रतिशत भाग

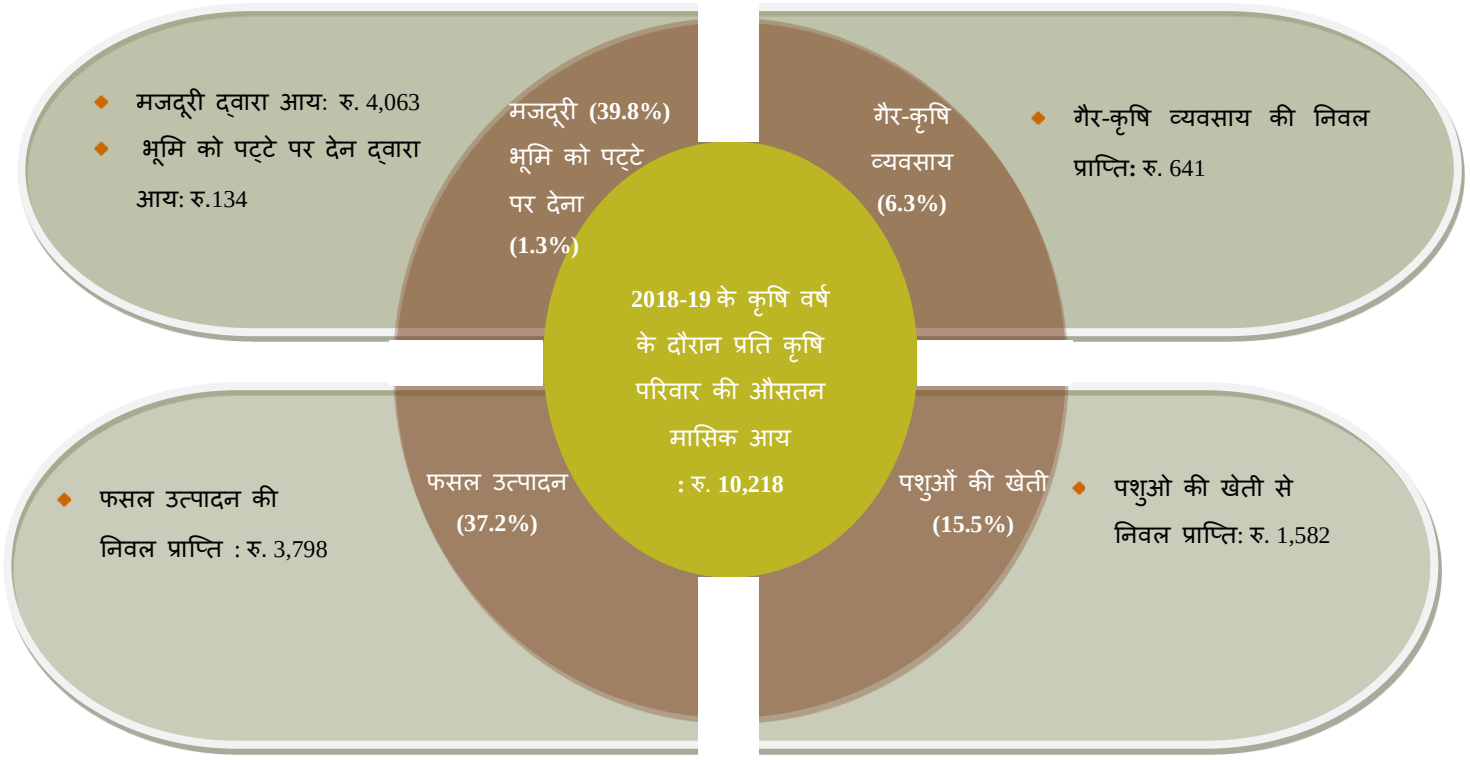


L. फसल उत्पादन से जुड़े कृषि परिवार

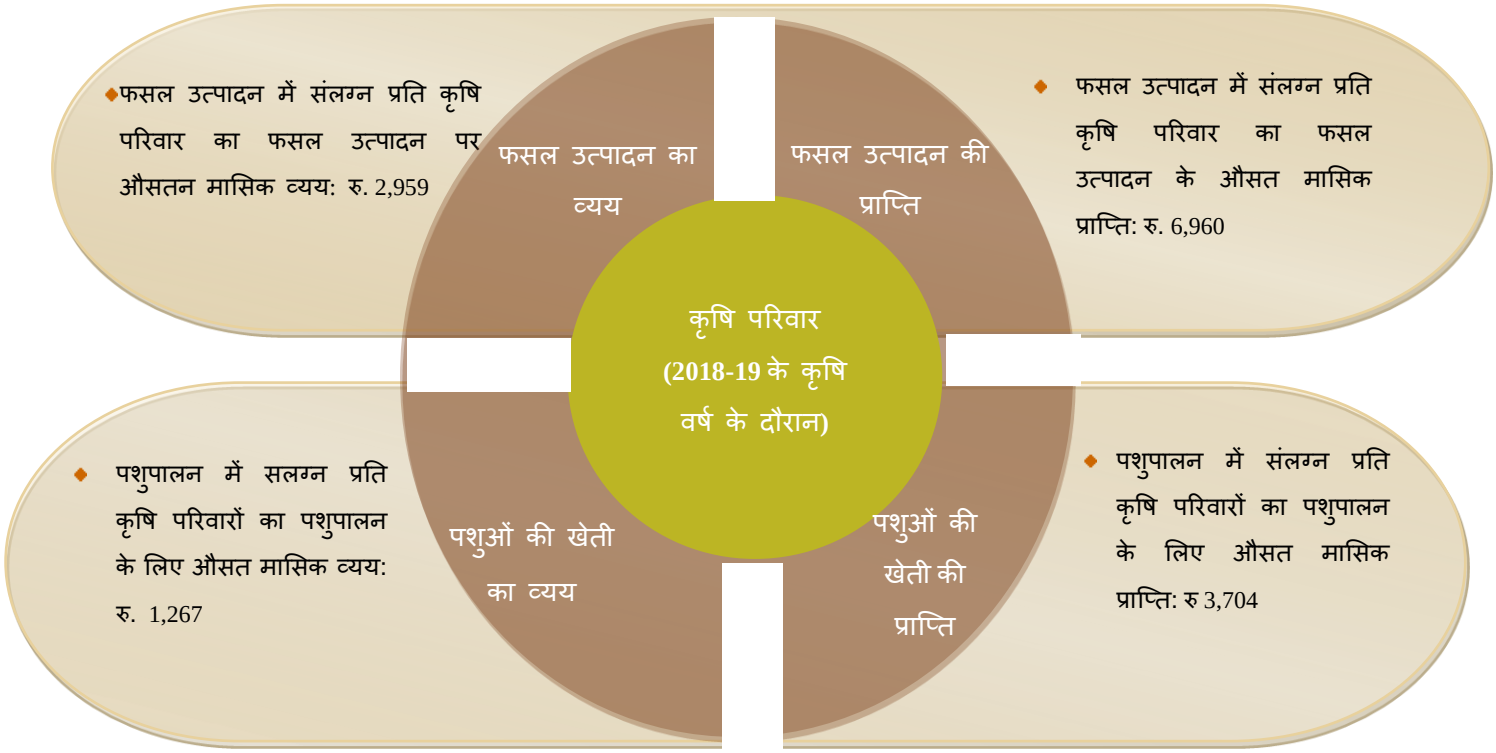
M. कृषि परिवारों द्वारा विभिन्न सुविधाएं/योजनाएं/तकनीकी सहायता मांगने की पहुँच



N. प्रति कृषि परिवार की औसतन मासिक आय

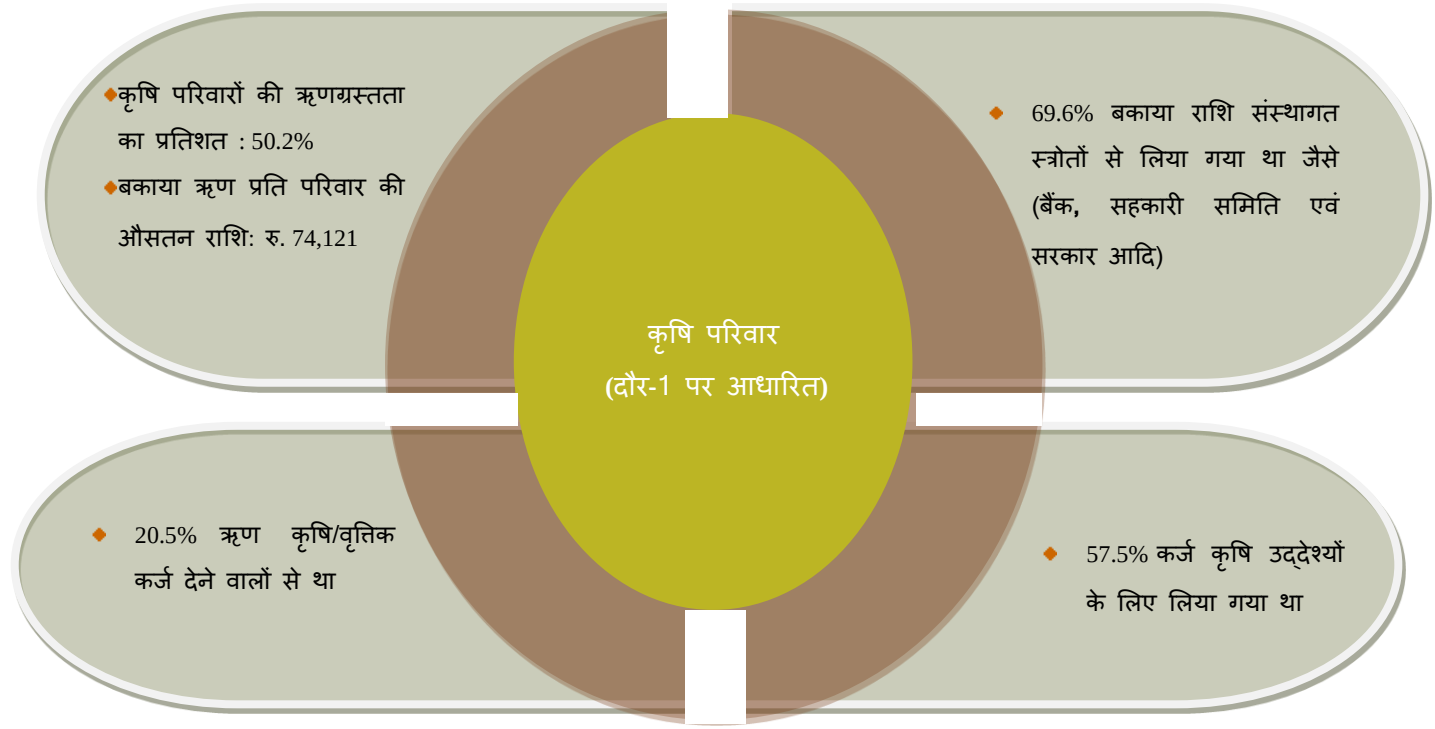


O. प्रति कृषि परिवारों की फसल उत्पादन एवं पशुओं की खेती पर मासिक औसतन व्यय एवं प्राप्तियां



- फसल उत्पादन में संलग्न प्रति कृषि परिवार का फसल उत्पादन पर औसतन मासिक व्यय: रु. 2,959
- फसल उत्पादन में संलग्न प्रति कृषि परिवार का फसल उत्पादन के औसत मासिक प्राप्ति: रु. 6,960
- पशुपालन में सलग्न प्रति कृषि परिवारों का पशुपालन के लिए औसत मासिक व्यय: रु. 1,267
- पशुपालन में संलग्न प्रति कृषि परिवारों का पशुपालन के लिए औसत मासिक प्राप्ति: रु 3,704

P. कृषि परिवारों की ऋणग्रस्तता



- कृषि परिवारों की ऋणग्रस्तता का प्रतिशत : 50.2%
- बकाया ऋण प्रति परिवार की औसतन राशि: रु. 74,121
- 69.6% बकाया राशि संस्थागत स्त्रोतों से लिया गया था जैसे (बैंक, सहकारी समिति एवं सरकार आदि)
- 20.5% ऋण कृषि/वृत्तिक कर्ज देने वालों से था
- 57.5% कर्ज कृषि उद्देश्यों के लिए लिया गया था

मुख्य बातें-II: अखिल भारतीय ऋण एवं निवेश सर्वेक्षण (ए आई डी आई एस): एनएसएस 77वां दौर (जनवरी से दिसम्बर, 2019)

- राष्ट्रीय सांख्यिकीय कार्यालय आमतौर पर देश के ग्रामीण एवं नगरीय क्षेत्रों में अखिल भारतीय ऋण एवं निवेश सर्वेक्षण (एआईडीआईएस) आवधिक अन्तराल पर करता है।
- अखिल भारतीय ऋण एवं निवेश सर्वेक्षण श्रृंखला में नवीनतम, यह सर्वेक्षण जनवरी से दिसम्बर, 2019 तक की अवधि के दौरान किया गया।
- सर्वेक्षण में यह सूचना प्रतिदर्श परिवार के एक ही समूह से दो दौरों में (दौरा 1: जनवरी-अगस्त, 2019 और दौरा 2: सितम्बर-दिसम्बर, 2019) में एकत्रित की गई।
- सम्पत्ति एवं देनदारियों पर सूचना एकत्र करने की सन्दर्भ अवधि 30.06.2018 थी और पूँजी निर्माण के लिए यह अवधि 01.07.2018 से 30.06.2019 थी।
- यह सर्वेक्षण ग्रामीण क्षेत्रों में 5,940 ग्रामीण क्षेत्रों के 69,455 परिवारों एवं 3,995 नगरीय खण्डों में 47,006 परिवारों में फैला हुआ था।

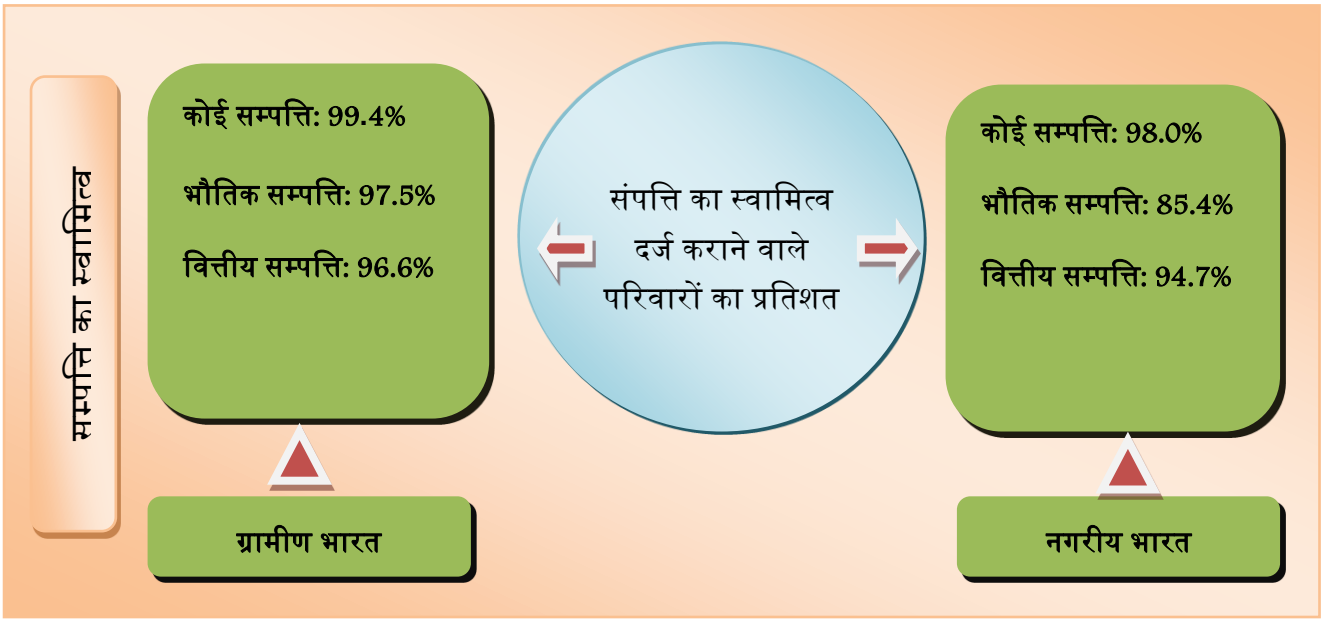
संकेतक

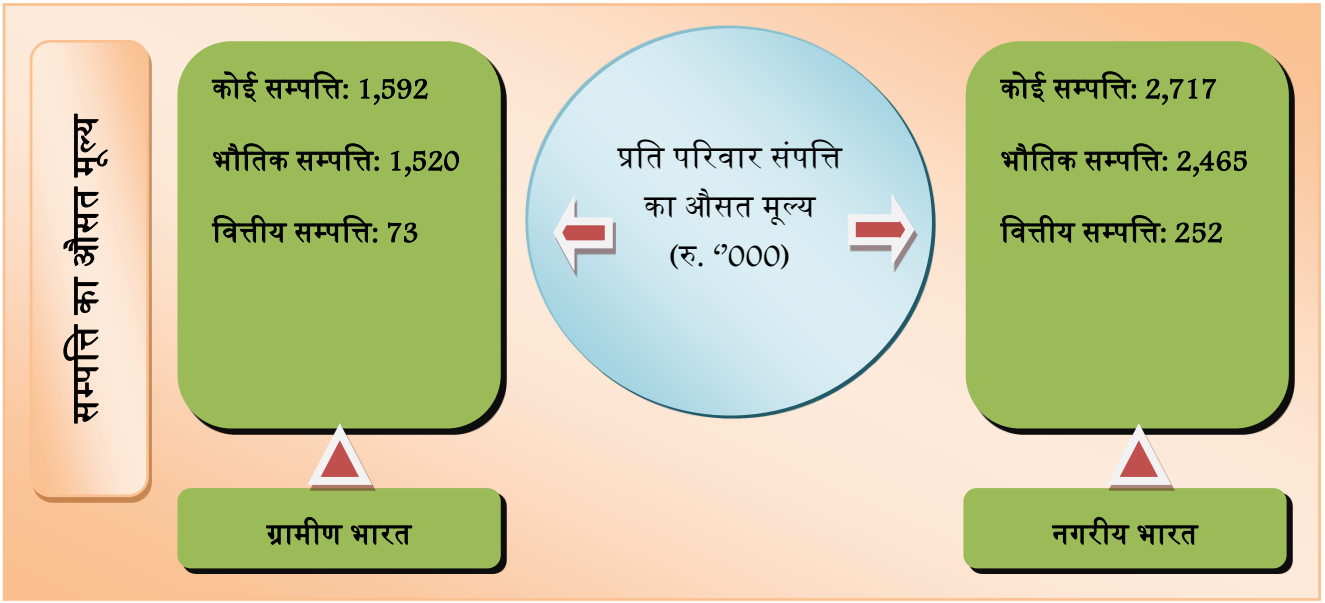
अखिल भारतीय ऋण एवं निवेश के सर्वेक्षण से निम्नलिखित संकेतक प्राप्त हुए :

- सम्पत्ति का औसत मूल्य (एवीए): 30.06.2018 तक प्रति परिवार अंगीकृत की गई सभी भौतिक एवं वित्तीय सम्पत्ति का औसत मूल्य
- ऋणग्रतस्तता की घटना(आईओआई): 30.06.2018 तक ऋण ग्रस्त परिवारों का प्रतिशत्
- ऋण की औसत धनराशि (एओडी): 30.06.2018 तक प्रति परिवार औसत नगद बकाया धनराशि
- ऋण-सम्पत्ति अनुपात (डीएआर): एक परिवार समूह द्वारा दी गई तिथि तक बकाया ऋण की औसत धनराशि (एओडी) को उनके द्वारा अंगीकृत की गई सम्पत्ति की औसत धनराशि के प्रतिशत् के रूप में व्यक्त करना

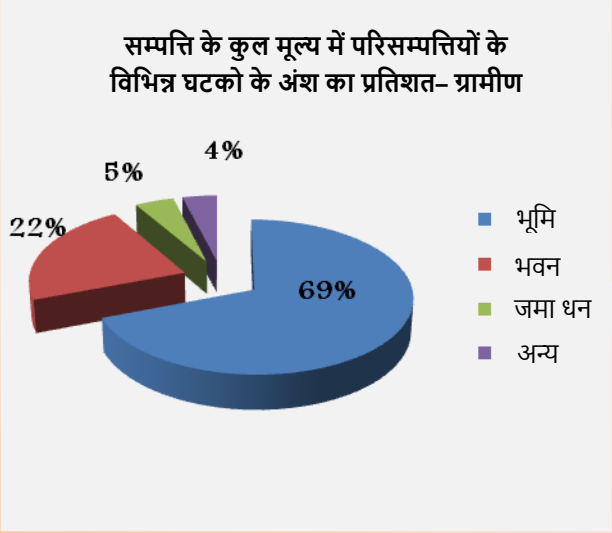
ए .सम्पत्ति

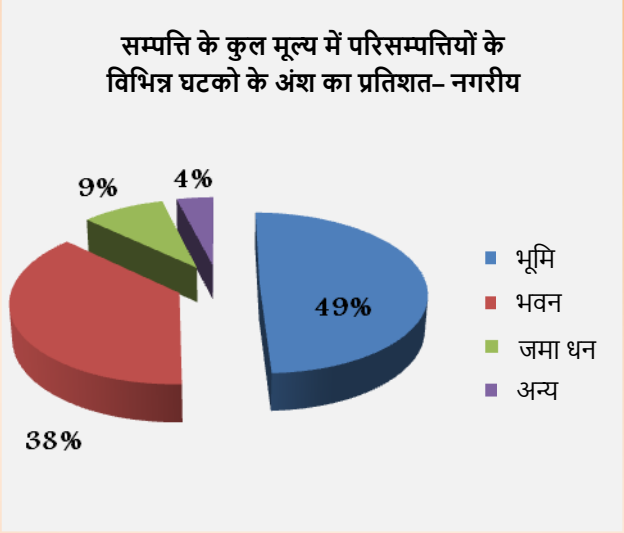
ए1. सम्पत्ति का स्वामित्व एवं सम्पत्ति का औसत मूल्य (एवीए)





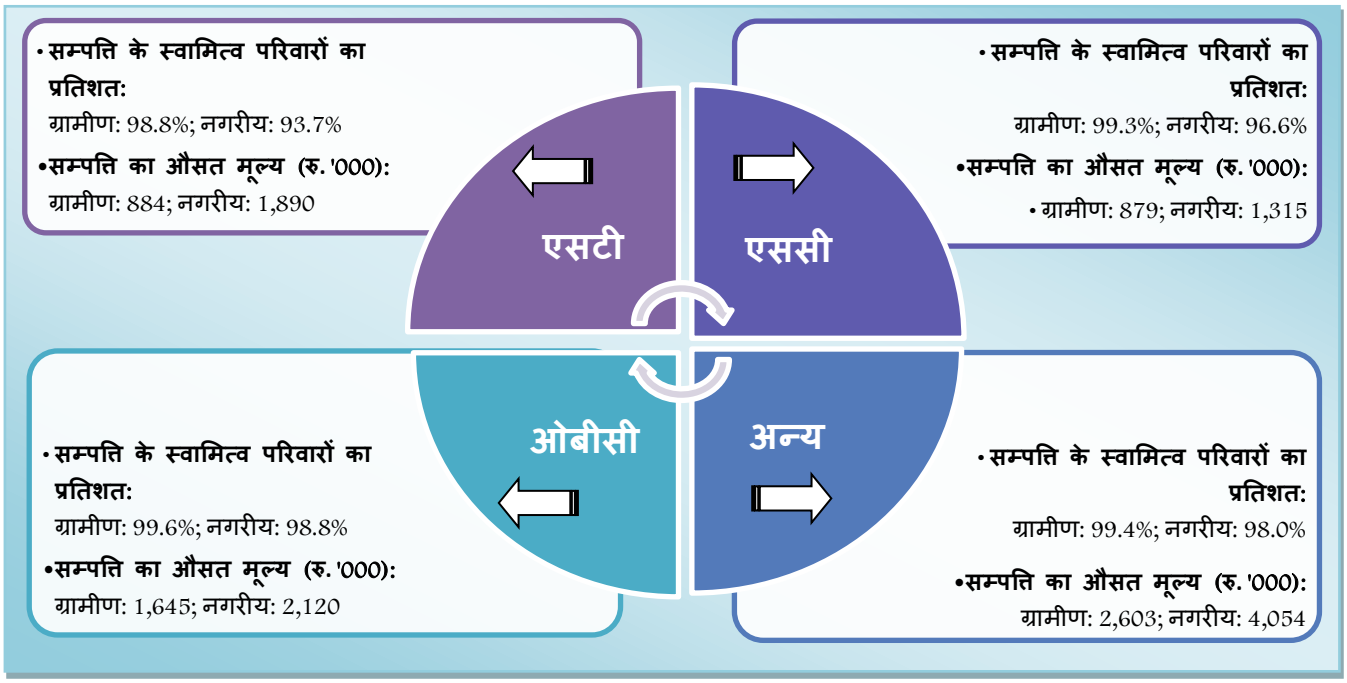
ए2. सम्पत्ति के कुल मूल्य में परिसम्पत्तियों के विभिन्न घटको के अंश का प्रतिशत



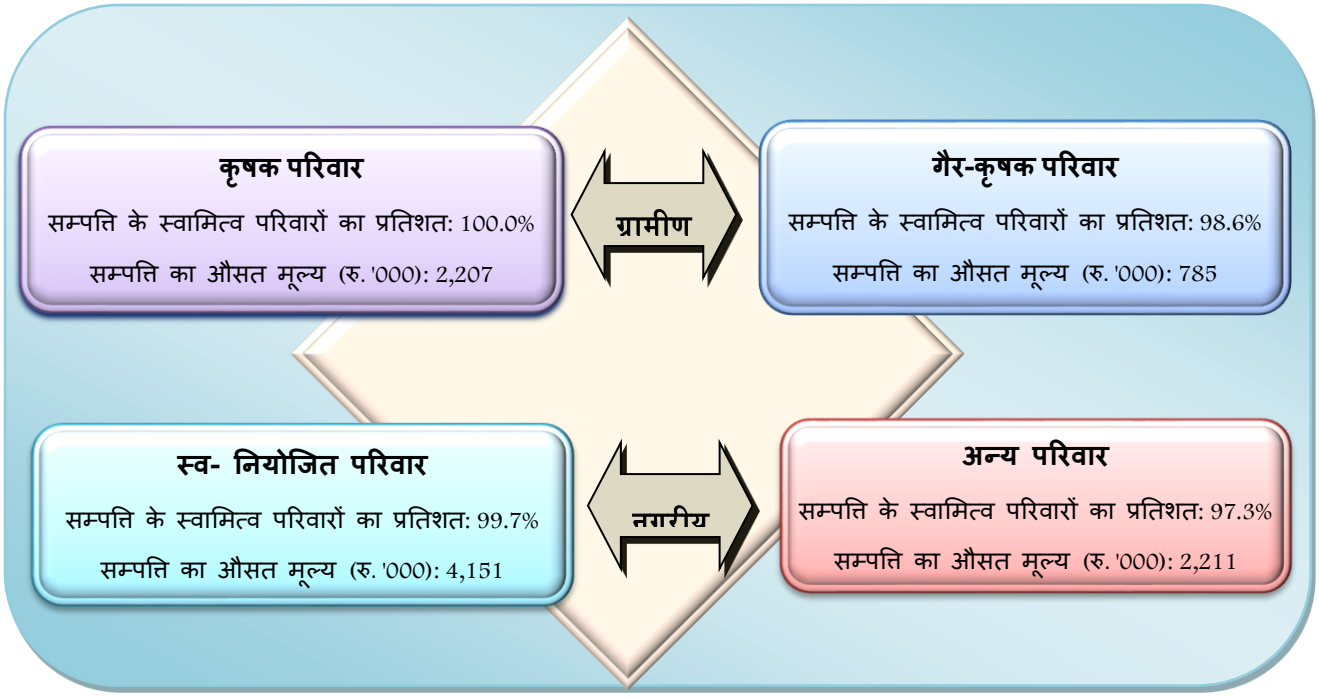


टिप्पणी : पशुधन,परिवहन उपकरण,कृषि उपकरण,गैर-कृषि व्यापार उपकरण एवं हिस्सेदारी अन्य सम्पत्ति के अंतर्गत आते हैं।

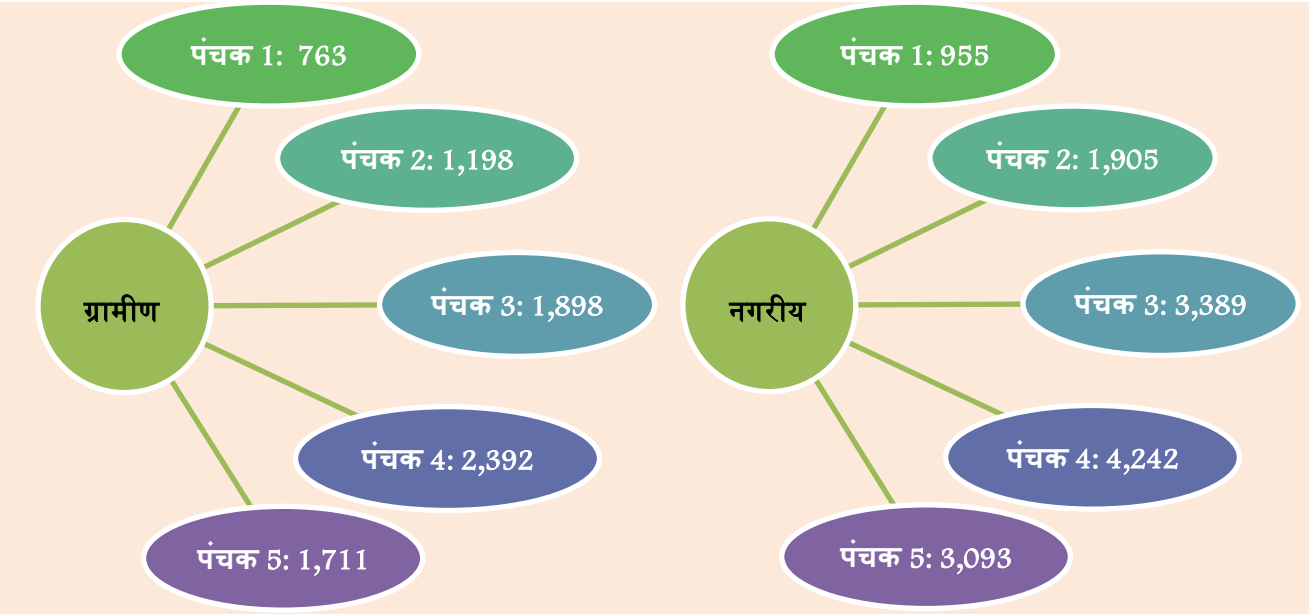
ए3.सामाजिक वर्ग द्वारा सम्पत्ति का स्वामित्व एवं सम्पत्ति का औसत मूल्य



ए4. परिवार की व्यवसायिक श्रेणी द्वारा सम्पत्ति का स्वामित्व एवं सम्पत्ति का औसत मूल्य

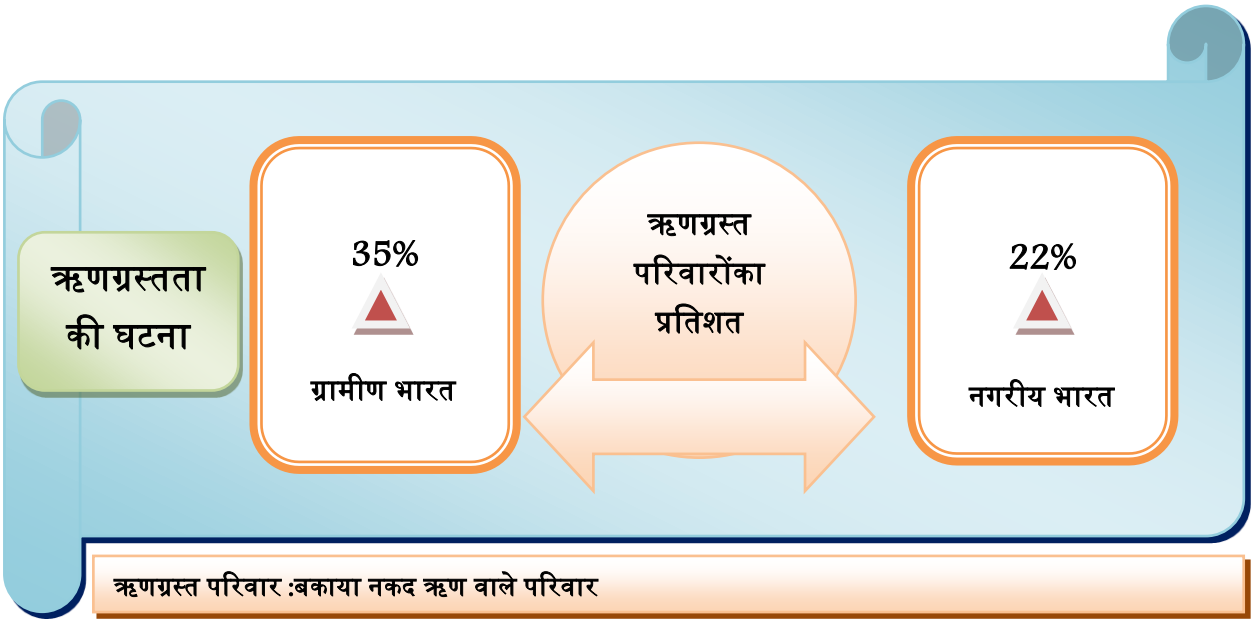


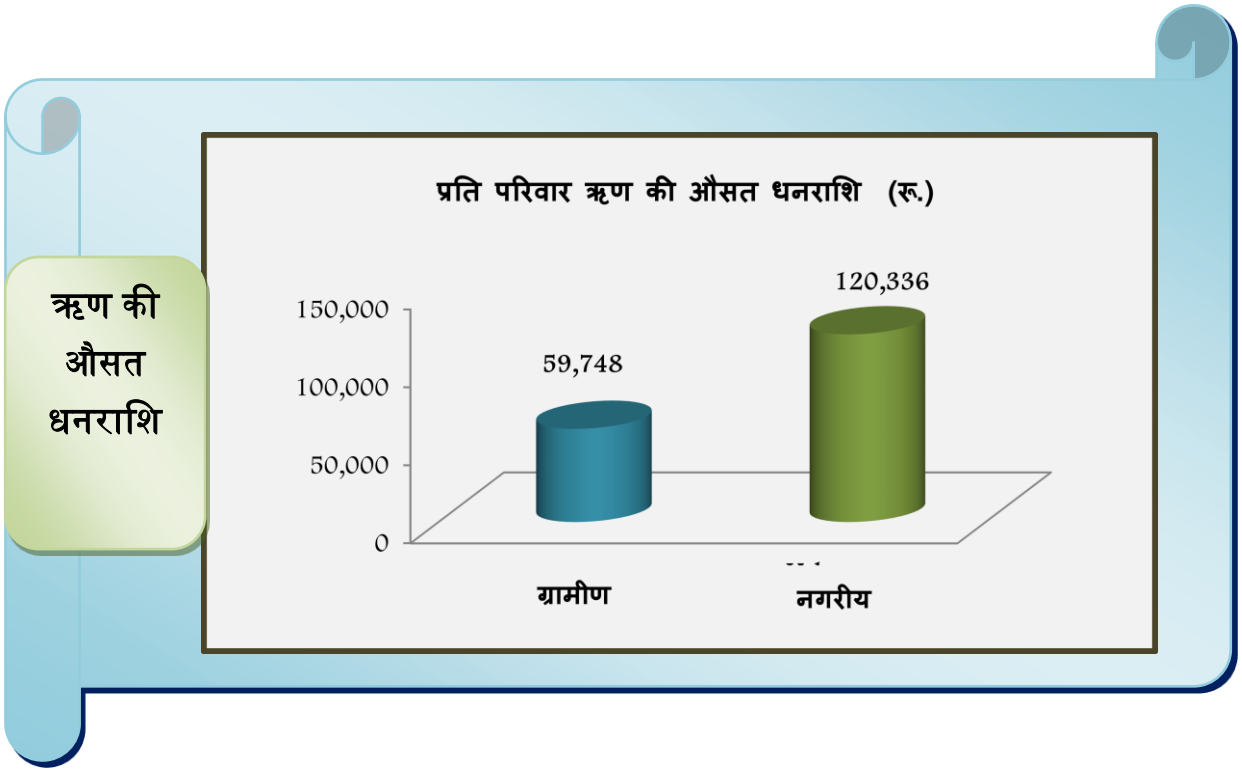
ए5.पारिवारिक उपयोक्ता व्यय के पंचक वर्ग द्वारा सम्पत्ति का औसत मूल्य *(रु.'000)*



बी .ऋणग्रस्तता

बी 1. ऋणग्रस्तता की घटना (आईओआई) और प्रति परिवार ऋण की औसत धनराशि (एओडी)



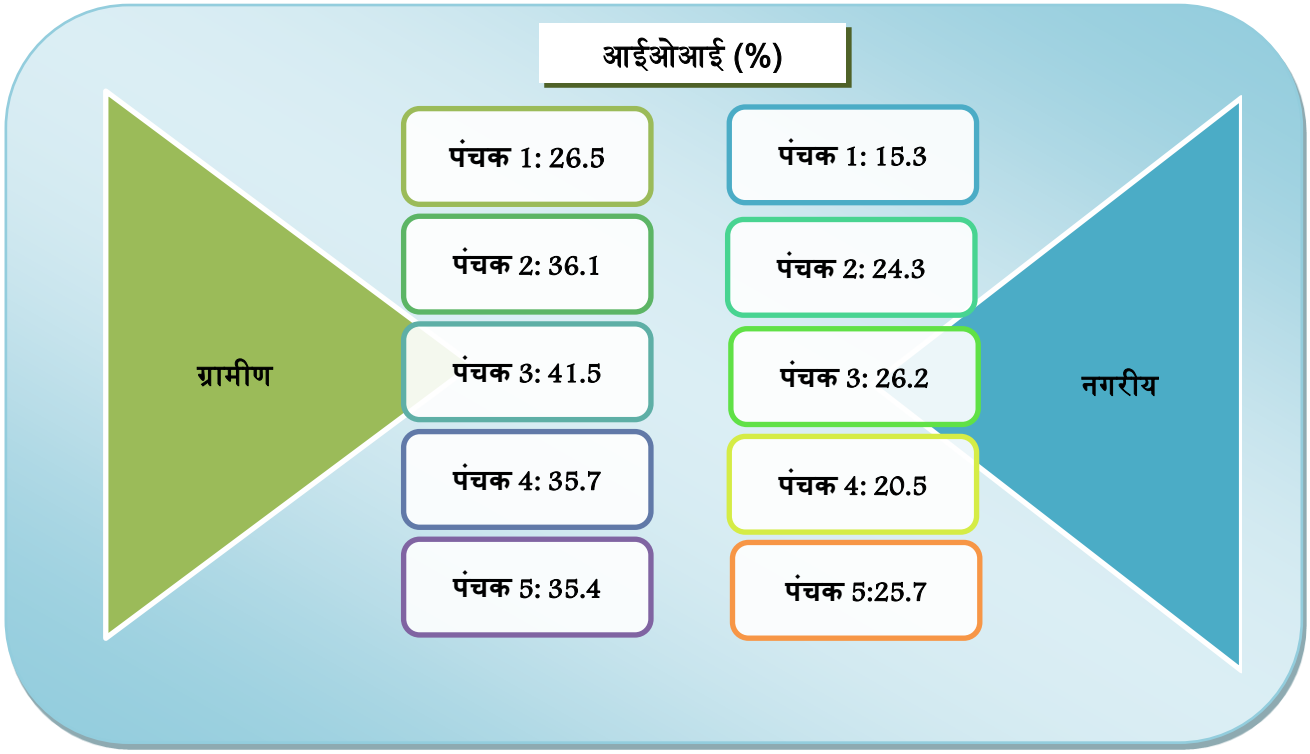


बी 2.परिवार की व्यवसायिक श्रेणी द्वारा ऋणग्रस्तता की घटना (आईओआई)

बी 3.ऋणग्रस्तता की घटना (आईओआई): अन्तर राज्यीय विविधता

आईओआई(%)	राज्य/केन्द्रशासित प्रदेश-ग्रामीण	राज्य/केन्द्रशासित प्रदेश-नगरीय
>35%	आंध्रप्रदेश,कर्नाटक, केरल,मध्यप्रदेश, ओडिशा, पंजाब, राजस्थान, तमिलनाडु, पुडुचेरी, तेलंगाना	आंध्रप्रदेश, केरल
>=10% &<=35%	अरूणाचल प्रदेश, असम, बिहार, छत्तीसगढ़, गोवा, गुजरात, हरियाणा,हिमाचल प्रदेश, जम्मू- कश्मीर, झारखंड, महाराष्ट्र,मणिपुर, मिजोरम, सिक्किम, त्रिपुरा, उत्तराखंड, उत्तर प्रदेश, पश्चिम बंगाल, अंडमान-निकोबार द्वीप समूह, चंडीगढ़	अरूणाचल प्रदेश, असम, बिहार, छत्तीसगढ़, गोवा, गुजरात, हरियाणा, हिमाचल प्रदेश, जम्मू- कश्मीर, झारखंड, महाराष्ट्र, मध्य प्रदेश, कर्नाटक, मणिपुर, मिजोरम, नागालैंड, पंजाब, राजस्थान, तमिलनाडु, तेलंगाना, सिक्किम, त्रिपुरा, उत्तराखंड, उत्तर प्रदेश, पश्चिम बंगाल, अंडमान-निकोबार द्वीप समूह, ओडिशा, लक्षद्वीप, पुडुचेरी, दादरा और नगर हवेली
<10%	दिल्ली, मेघालय, नागालैंड, दमन एवं दीव, लक्षद्वीप, दादरा और नगर हवेली	दिल्ली, मेघालय, चंडीगढ़, दमन एवं दीव

बी 4. पारिवारिक उपयोक्ता व्यय के पंचम वर्ग द्वारा ऋणग्रस्तता की घटना



बी 5. ऋण-सम्पत्ति अनुपात (डीएआर)

BROAD CONTENTS OF THE LAST FOUR ISSUES OF 'SARVEKSHANA'

(A) 108th ISSUE

PART –I: TECHNICAL PAPERS

PART-II: HIGHLIGHTS OF SOME OF THE REPORTS RELEASED BY NSO

(B) 109th ISSUE

PART –I: TECHNICAL PAPERS

PART-II: HIGHLIGHTS OF THE REPORT RELEASED BY NSO:

(C) Combined issue of 110th & 111th ISSUES

PART –I: TECHNICAL PAPERS

PART-II: HIGHLIGHTS OF THE REPORT RELEASED BY NSO:

The objective of this journal is to present analytical articles based on the results published on data collected through NSS, other surveys and censuses. 'Sarvekshana' welcomes contributions based on the NSS & other data sets and those relating to its methodology.

- Authors are requested to send soft copy of their papers/ articles in MS Word format to the Additional Director General, Survey Coordination Division, National Statistical Office, Sankhyiki Bhawan, Maharshi Valmiki Marg, Near Karkardooma Court, Delhi–110032 through e-mail @ nssocpd.coord-mospi@gov.in .

- Papers/ articles should be of single-spaced with margins of 1½ ''wide on the left and 1''on the right in MS Word format. The content of the article/paper should be in the sequence of **title of the paper, name of authors with their affiliations as foot note, abstract, keywords, main text part, acknowledgments and references.**

- For mathematical formulae, symbols, etc., standard notation may be followed. The graphs, charts and diagrams, if any, should be complete with all details and be such that direct reproduction can be obtained.

- The abstract should include summary of the paper not exceeding 150 words and a maximum of 6 important keywords used in the paper should also be mentioned.

- References should only include those papers, books etc. which have citation in the current paper and the same should be given in full e.g. name of author, title of publication, name of journal, date of publication etc.

- Subscription to 'Sarvekshana' should be sent to the Controller of Publication, Department of Publication, Civil Lines, Delhi-110054.

- Sarvekshana can also be downloaded free of cost from our website mospi.gov.in after due process of Internet enabled registration by the User/Researcher/Student.

Price: ₹300/-

SUGGESTIONS FOR IMPROVEMENT
ARE WELCOME