भारत सरकार
Government of India
सांख्यिकी और कार्यक्रम कार्यान्वयन मंत्रालय
Ministry of Statistics and Programme Implementation
समन्वय एवं गुणवत्ता नियंत्रण प्रभाग
Coordination & Quality Control Division (C&QCD)
राष्ट्रीय सांख्यिकीय कार्यालय
National Statistical Office

एन. एस. एस. के ASUSE, HCES और ASI सर्वेक्षण के परिणामों पर 18वीं राष्ट्रीय संगोष्ठी की रिपोर्ट

Report on 18th National Seminar on the result of ASUSE, HCES, and ASI Survey of NSS

08-09 अप्रैल,2025
रसायन विज्ञान विभाग हॉल, गोवा विश्वविद्यालय, पणजी, गोवा

08-09 April, 2025
Chemistry Department Hall, Goa University, Panaji, Goa

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Introduction

The Ministry of Statistics and Programme Implementation (MoSPI) is an executive ministry of the Government of India concerned with coverage and quality aspects of statistics released. The surveys conducted by the Ministry are based on scientific sampling methods.

2.   The Ministry of Statistics and Programme Implementation gives considerable importance to coverage and quality aspects of statistics released in the country. The statistics released are based on administrative sources, surveys and censuses conducted by the Centre and State Governments and non-official sources and studies. The surveys are designed by using scientific sampling methods. Field data are collected through dedicated field staff.

3.   NSO conducts nationwide sample surveys on various socio-economic issues such as employment unemployment, consumer expenditure, housing conditions and environment, health, education, nutrition, etc. to generate statistics and provide statistical products necessary for various planning and decision-making exercises of the Government of India. This includes Periodic Labour Force Survey (PLFS), Household Consumption Expenditure Survey (HCES), Short duration surveys Comprehensive modular Surveys (CMS), round based surveys on various subjects as per requirements of Ministries/Departments. NSO also conducts Annual Survey of Industries (ASI) on registered manufacturing sector under the Collection of Statistics Act 2008 and enterprise surveys on unincorporated non-agricultural enterprises annually. Besides these surveys, NSO collects data on rural and urban prices and plays a significant role in the improvement of crop statistics through supervision of the area enumeration and crop estimation surveys of the state agencies. It also maintains a frame of urban area units for drawing samples for Socio-Economic Surveys in urban areas.

4. The 18th National Seminar at Goa University, Panaji, Goa, focused on survey findings from NSS 78th Round: Multiple Indicator Survey (MIS), 79th Round: CAMS and AYUSH, the Annual Survey of Unincorporated Sector Enterprises (ASUSE) (2022-23), the Household Consumption Expenditure Survey (HCES) (2022-23), and the Annual Survey of Industries (ASI) (2021-22).

 Brief on the subjects of the surveys covered in 18th National Seminar:

NSS 78th Round: Multiple indicator Survey, 79th Round: Comprehensive Annual Modular Survey (CAMS) and Survey on Ayush, Annual Survey of Unincorporated Sector Enterprises (ASUSE), Household Consumption Expenditure Survey (HCES), and Annual Survey of Industries (ASI)

1.   78th Round: Multiple Indicator Survey (MIS) (2020-21)

The National Sample Survey Office (NSSO) carried out the Multiple Indicator Survey (MIS) covering the entire country in its 78th round. The survey was initially planned to be conducted

during the period January-December, 2020 but the field work was extended till 15.08.2021, due to the Covid-19 pandemic. The objectives of the MIS were:

- To collect information for developing estimates of some important Sustainable Development Goal (SDG) indicators
- To collect information Purchase/Construction of house(s)/ flat(s) by the household for residential purpose after 31.03.2014 and information on Migration.

2. 79th Round: Comprehensive Annual Modular Survey (CAMS) (2022-23)

As a part of the 79th round of the National Sample Survey (NSS) the Comprehensive Annual Modular Survey (CAMS) was conducted from July, 2022 to June, 2023. The primary objective of CAMS was to collect data to generate indicators related to education, out-of-pocket medical expenditure, use of mobile and internet, financial inclusion, ICT skills, possession of assets, etc. In addition, information related to drinking water, sanitation, energy use, birth registration, access to transport facilities, etc., was also collected. The information collected is also for developing estimates for important global indices for international reporting.

Broad indicators of 79th Round: Comprehensive Annual Modular Survey (CAMS) are as under:

i. Percentage of persons able to read and write short simple statements in their everyday life with understanding and also able to perform simple arithmetic calculations.
ii. Mean years of schooling in formal education
iii. Average out-of-pocket medical expenditure
iv. Percent urban population has convenient access to low-capacity public transport (bus, car, taxi, auto etc) within 500 meters from the place of living high-capacity public transport (*train, metro, ferry etc.*) within 1 km from place of living
v. Other telecom and skill related indicators

3. Survey on Ayush

The first exclusive all-India survey on 'Ayush' was conducted by the National Sample Survey Office (NSSO) from July 2022 to June 2023, as part of the 79th round of the National Sample Survey (NSS). The broad objectives of the survey were to collect information on:

- Awareness of people about the traditional system of healthcare (Ayush system of medicine),
- Uses of Ayush for prevention or treatment of ailments,
- Awareness of the households about home remedies, medicinal plants, local health tradition/folk medicine.

Additionally, the survey gathered information on household expenditure for treatments using Ayush medicine systems.

4. **Annual Survey of Unincorporated Sector Enterprises (ASUSE) (2022-23)**

NSO, MoSPI conducts Annual Survey of Unincorporated Sector Enterprises (ASUSE) annually with the primary objective of measuring various economic and operational characteristics of unincorporated non-agricultural establishments in manufacturing, trade and other services sectors (excluding construction). The survey collects data on various economic

characteristics of this sector including number of workers, Gross Value Added (GVA), emoluments paid, fixed asset owned, outstanding loan, besides, different types of operational characteristics such as type of ownership, nature of operation, registration status, use of ICT, etc.

5. **Household Consumption Expenditure Survey (HCES) (2022-23)**

NSO, MoSPI has conducted back-to-back Household Consumption Expenditure Surveys (HCES) in 2022-23 & 2023-24. The survey on Household Consumption Expenditure (HCES: 2022-23) was conducted during August, 2022 – July, 2023. The survey aims at generating estimates of household Monthly Per Capita Consumption Expenditure (MPCE) and its distribution separately for the rural and urban sectors of the country, for States and Union Territories, and for different socio-economic groups.

In the surveys of Household Consumption Expenditure conducted during 2022-23, the information on around 405 items of food and non-food consumed by the household are collected.

6. **Annual Survey of Industries (ASI)**

Most important source of industrial statistics of the registered/organised manufacturing sector of the economy. The survey is being conducted under the Collection of Statistics Act, 2008 as amended in 2017 and Rules framed there under in 2011. The ASI 2022-23 was conducted November 2023 to June 2024 with reference period, the accounting year of the factory, ending on any day during the financial year 2022-2023.

The primary objective of the survey is to provide a meaningful insight into the dynamics of change in the composition, growth and structure of registered manufacturing industries in terms of output, value added, employment, capital formation and many other parameters.

Program Schedule

Day 1, April 8th, 2025 (Tuesday)

0915- 1000 Hrs.		Registration
(Inougurol Session) (1000-1115 Hrs)	10:00-10:10	Lamp lighting & Prayers
	10:I 0-10:20	Welcome Address by **Sh. Kishore Kumar, ADG(CQCD)**
	10:20-10:30	Address by **Sh. Horilal B. Menon, Vice Chancellor (Goa University)**
	10:30-10:40	Inaugural Address by **Ms. Geeta Singh Rathore, DG, NSS, MoSPI**
	10:40-10:45	Vote of Thanks by **Sh. B. Mohan Jinnappa, Director, RO, *Goa***
	10:45-11:15	Cultural Programmes
11:15-11:30 Hrs		**High Tea**
11:30-1 1:45Hrs		Presentation by Deportment of School Education & Literacy reg. utility of NSS data in education related indicators
11:45-12:00 Hrs		Presentation by Ministry of Health & Family Welfare reg. utility of NSS data in Health Accounts
12:00-12:15 Hrs		Presentation by Sh. Santanu Pramanik, Lead Statistician at CEGIS on Spatio-temporal trend in the magnitude of informal sector based on various survey and admin data

	Topic: Multiple Indicator Survey (MIS): NSS 78th Round (2020-21) **Chair: Dr. G.C. Manna, Former Chairman of Working Group of NSS 78th Round**		
Technical Session-I	12:15-13:30 Hrs	1)	A reflection of inequality in attainment of ICT skills across social groups in India and Uttar Pradesh: Evidences from Multiple Indicators Survey (MIS) Discussant: Nagendra Kumar Maurya, Assistant Professor, Department of Applied Economics, University of Lucknow and Puneet Kumar Shrivastav, Assistant Director (Faculty), National Institute of Labour Economics Research & Development
		2)	Predicting an NSS Indicator Value: A Machine Learning Approach Discussant: Piyush Kumar Singh, ISS, Deputy Director, DGCIS
		3)	Financial Inclusion and Indebtedness in India: Insights from NSS 78th Round Discussant: Binod Bihari Jena, Assistant Professor in Economics, Govt. College, Koraput, Odisha
13:30-14:30 Hrs			Lunch
	Topic Multiple Indicator Survey (MIS): NSS 78th Round (2020-21)) and Survey on Ayush: NSS 79th Round **Chair: Sri. Pravin Srivastava, Former Chairman of Working Group of 79th Round and ex-CSI**		
Technical Session-II	14:30-16:00 Hrs	1)	WASH Deprivation across Socio-Economic and Demographic Groups: Insights from MIS 2020 Household Data Discussant: Anushka Mothur and Tapan Kumar Chakrabarty, Department of Statistics, North-Eastern Hill University, Shillong, Meghalaya
		2)	Evaluating the digital competency levels among the youth: Insights from India. Discussant: Avijit Bhargarh, Consultant, DMEO NITI Aayog.
		3)	Utilisation of Ayush Systems of Medicine in West Bengal: An Economic Analysis based on 79th Round of Notional Sample Surveys on AYUSH Discussant: Ashish Moktan, Research Scholar, Department of Economics, University of North Bengal & Assistant Professor, Victoria Institutions (College), Kolkata and Amlan Majumder, Associate Professor, Department of Economics, University of North Bengal, Darjeeling, West Bengal
16:00-16:15 Hrs			Tea Break
	Topic: Household Consumption Expenditure Survey (HCES) **Chair: Sh. Siddhartha Kundu, ADG-Household Survey Division, NSO, MoSPI and Prof. Ankush Agrawal, Professor of Economics, IIT Delhi.**		
Technical Session-III	16:15-18:00 Hrs	1)	A neural network approach to identify features associated with multidimensional poverty in rural India Discussant: Kasturi Rajeswari, DDG, Statistics, National Tuberculosis Institute, Bangalore & Yadav Ashish, DD, Statistics, National Tuberculosis Institute, Bangalore
		2)	Effects of Publicly Funded Health Insurance Schemes on Hospitalizations, Out- of-pocket Expenditures and Catastrophic Expenditures Discussant: Mamta Choudhary, Assistant Director, FOD, SRO Jodhpur, NSO
		3)	Comparative Analysis of Consumption Patterns in Women-Headed and Men-Headed Households: Insights from the Household Consumption Expenditure Survey 2022-23 Discussant: Suman Patel, ISS, Deputy Director, FOD, NSO

Day 2, April 9th, 2025 (Wednesday)

<table>
<tr>
<td colspan="3" style="background-color:#2e3192;color:white">Topic: Annual Survey of Unincorporated Sector Enterprises (ASUSE)
Chair: Sh. Salil Kumar Mukhopadhyay, ADG, Enterprise Survey Division, NSO, MoSPl and Prof. Badri Narayan Roth, IIT Hyderabad</td>
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<tr>
<td>Technical Session -IV</td>
<td>10:30-11:45Hrs</td>
<td>1) Assessing the Productivity-Investment Nexus in Informal Economies: Evidence from India
Discussant: Sonakhya Somaddar, Deputy Director, EnSD, NSO & Ujjval Srivastava, Deputy Director, RAU,MoSPI
2) Estimation of Annual Change in Inventory (CII) for the Unorganised Sector -using two years ASUSE data
Discussant: Dipankar Mitra, Deputy, Director, Notional Account Division, MoSPI
3) Glimpses of the platform economy related to App cabs and Delivery services revealed from ASUSE rounds 2021-22 / 2022-23 and suggestions for further explorations
Discussant: Jugoprokash Bhattacharjee, Ex-ADG, SDRD, MoSPl</td>
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<td colspan="2">11:45-12:00 Hrs</td>
<td>Tea Break</td>
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<td colspan="3" style="background-color:#2e3192;color:white">Topic: Annual Survey of Industries (ASI)
Chair: Sh. Salil Kumar Mukhopadhyay, ADG, Enterprise Survey Division, NSO, MoSPl and Prof. Badri Narayan Roth, IIT Hyderabad</td>
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<td>Technical Session-V</td>
<td>12:00-12:50 Hrs</td>
<td>1) Dynamics of contract workers in Manufacturing Sector in India: Evidence from ASI data
Discussant: A. K. Panigrahi, Director, Industrial Statistics Wing, Enterprise Survey Division, NSO, Ankita Mondal, Assistant Director, Industrial Statistics Wing, Enterprise Survey Division, NSO & Aditya Mandal, Assistant Director, Directorate General of Commercial Intelligence & Statistics, Department of Commerce
2) Supply-Use and Input-Output Tables Using ASI data
Discussant: Sourish Dutta, Assistant Professor, Vivekananda Institute of Professional Studies-Technical Campus (VIPS-TC), Delhi</td>
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<td>Concluding Session</td>
<td>12:50-14:00 Hrs</td>
<td>Certificate Distribution to Discussants.
Concluding Remarks and Way forward by Sh. Pravin Srivastava, Former Secretary, MoSPI and CSI
Vote of Thanks by Sh. Subramanya Rao, DDG (CQCD).</td>
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<tr>
<td colspan="2">14:00-15:00 Hrs</td>
<td>Lunch</td>
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Proceedings

The National Statistics Office (NSO), Ministry of Statistics & Programme Implementation (MoSPI), organized the **18ᵗʰ National Seminar** at Goa University, Panaji, Goa, on **8ᵗʰ and 9ᵗʰ April 2025**. The seminar focused on survey findings from NSS 78th Round: Multiple Indicator Survey (MIS) (2020-21), 79th Round: CAMS and AYUSH (2022-23), the Annual Survey of Unincorporated Sector Enterprises (ASUSE) (2022-23), the Household Consumption Expenditure Survey (HCES) (2022-23), and the Annual Survey of Industries (ASI) (2022-23).

The seminar was inaugurated by Ms. Geeta Singh Rathore, **Director General (NSS)** and was graced by the presence of **Shri Pravin Srivastava**, Former Secretary, MoSPI & Chief Statistician of India and **Prof. Harilal B. Menon**, Vice Chancellor of Goa University.

In his **Welcome Address**, ADG (CQCD), NSO highlighted the Ministry's focus on transparency, timeliness, and digital innovation in survey implementation. The **Inaugural Address by DG (NSS)** emphasized MoSPI's continued technological evolution in data collection process and initiatives such as **monthly PLFS estimates**, **district-level labour statistics**, and the upcoming **Domestic Tourism and National Household Travel Surveys**. She focused upon quick data releases made by NSO, MoSPI for all surveys particularly, PLFS and highlighted that NSO is celebrating 75the year of NSS in 2025 for which a series of year long activities are being planned.

Vice-Chancellor **Prof. Menon** emphasised the collaborative role of academic institutions in advancing a culture of **data-driven decision-making**, calling statistics "a tool for social listening" that amplifies citizens' voices. The Vice-Chancellor proudly mentioned that Goa University is the first in India to implement the National Education Policy (NEP) curriculum, which mandates the

submission of research papers in the final semester of all master's programs, where NSS data plays a crucial role. He further emphasized that the seminar would serve as the starting point for future collaborative efforts, which will highly encourage and greatly beneficial for students, researchers, and scholars alike.

Following the inaugural session, the cultural programme featured an exquisite Bharatnatyam dance performance by Dipankar Mitra and the vibrant Goan folk dance, Fhugdi, showcasing the rich cultural heritage of India.

Technical Sessions

- **Presentation by Department of School Education & Literacy reg. Utility of NSS data in education related indicators**
- **Discussant: Shri. V.R. Hegde, Dy. Director General,** DoSEL, Department of School Education & Literacy, M/o Education

A presentation on *Bridging Data Gaps - Key Role of NSS Surveys in Education Policy Planning* was presented by DoSEL highlighting the importance of NSS surveys in education policy planning, as administrative data sources like UDISE+, AISHE, and POSHAN Tracker cover different age groups but often miss out on adults with age over 25 years and out-of-school children. UDISE+ collects data from over 14 lakh schools and 25 crore students, helping shape school-related policies, but it cannot capture indicators like adult literacy, NEET rates, or dropout reasons. NSS surveys fill these gaps by providing detailed, people-centric data that reflect real-life challenges. The presentation urges combining administrative and NSS survey data to make better policies, improve global rankings, and achieve NEP 2020 and SDG 4 goals.

- **Presentation by MoHFW reg. utility of NSS data in Health Accounts**
- **Discussant: Shri. Dharam Prakash, Dy. Director,** Ministry of Health and Family Welfare (MoHFW)

The presentation on utility of NSS data in National Health Account estimation explained how the government uses data from the National Sample Survey (NSS) to understand how much people spend on healthcare. The speaker mentioned that NSS data is crucial for understanding household health spending. Provides detailed data on morbidity, hospitalization, healthcare utilization, and expenditure patterns at the household level and supports accurate estimation of out-of-pocket expenditure by providing household level data for estimation of out-of-pocket expenditure, a crucial component of private health spending used in National Health Accounts.

NSS surveys, especially the 75th round, help collect detailed information about hospital visits, medicines, and maternity care. These surveys show how much people are spending and whether they are using public or private hospitals. The presentation showed that government health spending has gone up over the years, and out-of-pocket spending by people has gone down. This is a good sign because it means people are getting more support from public health schemes.

In conclusion, the speaker said that NSS data is very useful for health planning. It helps the government understand where the money is being spent and which services need more investment.

- **Presentation on Spatio-Temporal Trend in the magnitude of informal sector based on various survey and admin data**
- **Discussant:** Shri Santanu pramanik, Lead Statistician at CEGIS

This presentation focused on how informal sector employment has changed over time and across different regions of India. The informal sector includes jobs that are not regulated or protected by the government, such as daily wage labourers, street vendors and small shop owners.

In conclusion, the presentation highlighted that understanding where and how informal jobs exist is important for planning better employment policies. It recommended steps like better education, skill training, and social security for informal workers to help them move into formal jobs.

Open Discussion:

A brief discussion was held after the presentations, during which it was suggested that key indicators derived from survey data—used for further studies and policy formulation—should be analyzed alongside related administrative data. This integrated approach would help provide a more accurate picture of the actual situation. However, gaps in administrative data could lead to misinterpretations and potentially misleading policy decisions. Ministries are requested to take these factors into account when interpreting survey findings.

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Technical Session-I

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Topic: Multiple Indicator Survey (MIS): NSS 78th Round (2020-21)
Chaired by Dr. G.C. Manna, Former DG&CEO, NSS & chairman of Working Group of NSS 78th Round

The Technical Session I was Chaired by Dr. G. C. Manna, ex-DG, MoSPI. In his introductory remark, Dr. Manna highlighted the uniqueness of the 18th National Seminar as various survey subjects, viz., NSS 78th round (Multiple Indicator Survey), NSS 79th round (Comprehensive Annual Modular Survey), Annual Survey on Unincorporated Sector Enterprises, and Household Consumption Expenditure Survey, were covered in this seminar. Three papers were presented during this technical session based on the NSS 78th round (Multiple Indicator Survey). The key discussions are highlighted below.

- **Presentation I - A reflection of inequality in attainment of ICT skills across social groups in India and Uttar Pradesh: Evidences from Multiple Indicators Survey (MIS)**
- **Discussant:** Shri Nagendra Kumar Maurya, Assistant Professor, Department of Applied Economics, University of Lucknow and Shri Puneet Kumar Shrivastav, Assistant Director (Faculty), National Institute of Labour Economics Research & Development.

The presentation focused on SDG Indicator 4.4.1, which aims to increase the proportion of youth and adults possessing information and communications technology (ICT) skills. It also highlighted the *Digital India* programme, a flagship initiative envisioned to transform India into a digitally empowered society and knowledge-based economy. The study aimed to measure the level of prevalence of ICT skills among individuals in Uttar Pradesh and as well as at the all-India level.

The presentation also examined the presence of inequalities in ICT skill acquisition across different social groups, both at the national level and within the state of Uttar Pradesh. The analysis highlighted a large segment of the population lacks ICT skills, particularly in Uttar Pradesh. Gender and social category disparities are evident, with women and marginalized groups having

significantly lower ICT skill levels. Notably, much of the inequality exists within social groups rather than between them.

The study concluded that rapid upskilling in ICT is essential and there is an urgent need to strengthen the ICT skill ecosystem through inclusive policy measures.

- **<u>Presentation 2: Predicting an NSS Indicator Value: A Machine Learning Approach</u>**
- **Discussant:** Shri Piyush Kumar Sing, ISS, Deputy Director, DGCIS

This presentation was the one of the most highlighted papers of the seminar which showcased the effective application of Machine Learning (ML) techniques to NSS data for predicting key variables. Building upon prior work utilizing data from the NSS 76th round, the current study employed the developed ML models on data from the NSS 78th round to predict household access to latrines, using seven input variables.

The results revealed minimal deviations between the predicted and actual values across various sectors and at the all-India level. The study concluded that ML models hold significant potential to streamline survey instruments, thereby reducing respondent burden and enhancing efficiency. Additionally, these models may be extended to predict other variables of interest. However, it was noted that ML models are resource-intensive and, due to their inherent complexity, may sometimes pose challenges in interpretation.

- **<u>Presentation 3: Financial Inclusion and Indebtedness in India: Insights from NSS 78th Round</u>**
- **Discussant:** Shri Binod Bihari Jena, Assistant Professor (Economics), Govt. College, Koraput, Odisha

The paper analyzes financial inclusion and indebtedness using unit-level data from the NSS 78th round. It emphasizes that financial inclusion is a powerful instrument for reducing poverty and promoting shared prosperity. Access to formal finance can stimulate job creation, enhance resilience to economic shocks, encourage investment in human capital, and help reduce income inequality. Moreover, women's financial inclusion is particularly crucial, as it empowers them to rise out of poverty, avoid exploitation, and participate more fully in economic activities. The objective of the study was to assess the current status of financial inclusion and indebtedness in India and to examine the factors influencing them.

The findings indicate that the southern region exhibits the highest levels of both financial inclusion and indebtedness, while the northeastern region records the lowest. Gender disparities are notable, with women experiencing lower financial inclusion and higher indebtedness. A lower likelihood of financial inclusion and indebtedness was observed in urban areas, among Muslims and other minority groups, larger households, and individuals with lower levels of education. Conversely, higher financial inclusion was associated with wealthier, more educated, and ever-married individuals.

The study concludes that targeted interventions are essential for population subgroups with lower financial inclusion in order to achieve universal financial access.

Open discussion on the presentations of technical session -I:

- A general observation was made that the findings could have been further strengthened by corroborating them with the available administrative data, thereby adding significant value to the presentations.
- It was noted that the survey data on ICT skills are enquiry-based rather than record-based; consequently, a comparative analysis with the NASSCOM National Skills Registry could have yielded more robust insights.
- In the context of reducing the length of the survey schedule through the application of Machine Learning models, it was suggested that panel data could be more appropriate for achieving this objective. Furthermore, it was recommended that the models be tested on raw datasets, as opposed to pre-cleaned data, for better assessment of their performance.

Technical Session II, Day-1 (08.04.2025)

Topic: Multiple Indicator Survey (MIS): NSS 78th Round (2020-21)) and Survey on Ayush:NSS 79th Round

Chaired by Shri. Pravin Srivastava, Former Secretary &Chief Statistician of India and Chairman of Working Group of NSS 79th round

- **Paper I: WASH Deprivation across Socio-Economic and Demographic Groups: Insights from MIS 2020 Household Data**
- **Discussant:** Anushka Mathur and Tapan Kumar Chakrabarty from the Department of Statistics, North-Eastern Hill University, Shillong, Meghalaya

This paper investigates the disparities in access to Water, Sanitation, and Hygiene (WASH) services across different socio-economic and demographic groups in India. Using data from the 2020 Multiple Indicator Survey (MIS), the study highlights significant inequalities based on income levels, education, urban-rural divides, and regional differences. The analysis reveals that households with lower income, limited education, and rural location experience the most pronounced deprivation. Additionally, it brings out the intersectional challenges faced by women and children in accessing WASH services. The paper concludes with evidence-based recommendations aimed at addressing these disparities and promoting equitable access to WASH infrastructure and services, especially for the most disadvantaged groups.

- **Paper II: Utilisation of AYUSH Systems of Medicine in West Bengal: An Economic Analysis based on 79th Round of National Sample Surveys on AYUSH**
- **Discussant:** Ashish Moktan, Research Scholar & and Amlan Majumder, Associate Professor at the University of North Bengal, at the same university,

This paper analyzes the utilisation of AYUSH systems of medicine in West Bengal using data from the 79th Round of the National Sample Survey. The study applies a binary multivariate logit regression model to assess the probability of individuals using AYUSH treatments in the past year. It incorporates both demand- and supply-side variables in its framework. Key findings show that older individuals, more educated respondents, and especially women (who are twice as likely as men to use AYUSH) have a higher likelihood of utilisation. Household affordability plays a significant role, with a nearly 17-fold increase in likelihood observed for households with in-kind or informal income sources up to INR 4000. On the supply side, awareness of AYUSH systems drastically increases the chance of utilisation—users aware of AYUSH are more than 20 times more likely to use it. The study also notes regional differences in usage and recommends targeted policy interventions to enhance access and awareness of AYUSH systems in the state.

Technical Session III, Day-1 (08.04.2025)

Topic: Household Consumption Expenditure Survey (HCES)

Chaired by Shri Siddhartha Kundu, ADG, HSD, NSO and prof. Ankush Agrawal, professor of economics, IIT, Delhi

In session, three papers related to the Household Consumption Expenditure Survey (HCES) were presented and the paper-wise highlights of presentation and deliberations (comments /suggestions) thereon are presented below:

- **Paper I: A neural network approach to identify features associated with multidimensional poverty in rural India**
- **Discussant:** Kasturi Rajeswari, DDG, Statistics, National Tuberculosis Institute, Bangalore & Yadav Ashish, DD, Statistics, National Tuberculosis Institute, Bangalore

Presentation highlights:

The paper explores characteristics or features associated with household-level multidimensional poverty in rural India using data from the HCES 2022–23, which captures 9 of the 12 MPI sub-indicators. It employs both Logistic Regression (LR) and Deep Neural Network (DNN) models to identify key features associated with MPI-based poverty classification. The study finds that features like household size, access to phone and internet, education level of household members, and marital status of the household head significantly influence a household's MPI poverty status. It finds Education, marital status, age and household size as best predictors.

The DNN model outperforms the LR model in predicting MPI_poor status in terms of accuracy and feature interpretation. Notably, income (measured through Log MPCE) appears as a relevant but less dominant factor, emphasizing that poverty is not solely income-driven. The study affirms the multidimensional nature of poverty and demonstrates the usefulness of AI-ML techniques like deep learning in analyzing complex national survey data. It also underscores the growing policy relevance of MPI in India, as reflected in the shift from income-based to multidimensional poverty assessment led by NITI Aayog.

The study recommends that in future HCES information on access to bank accounts, maternal health and nutrition may also be recorded.

- **Paper II: Effects of Publicly Funded Health Insurance Schemes on Hospitalizations. Out- of-pocket Expenditures and Catastrophic Expenditures**
- **Discussant:** Mamta Chaudhary, Assistant Director, FOD, SRO, Jodhpur, NSO)

The paper examines the effects of Publicly Funded Health Insurance (PHFI) schemes on hospitalization rates, out-of-pocket expenditures (OOPE), and catastrophic health expenditures (CHE) using data from the Household Consumption Expenditure Survey 2022-23. Through multivariate logistic regression analysis, the paper finds that PHFI enrolment does not significantly increase hospitalization rates, indicating that mere insurance coverage does not lead to greater

healthcare utilization. However, it significantly influences the type of healthcare facility chosen—PHFI-enrolled households are 43.8% less likely to use private hospitals, showing a shift in preference toward public healthcare facilities. In most of the states PFHI is merged with PM-JAY (Pradhan Mantri Jan Aryoga Yojana).

Despite this redirection toward public facilities, the study reveals that PHFI-enrolled households still face high OOPE and a greater likelihood of incurring CHE, especially when accessing mixed public-private services. This indicates that the intended financial protection of PHFI schemes is not fully realized, as substantial financial burdens persist. The findings highlight the need for strengthening public healthcare infrastructure and expanding the scope of coverage under PHFI schemes. The study calls for further research into patient satisfaction and outcomes in public hospitals, and suggests that continuous evaluation and reform are essential for achieving the goal of financial risk protection in India's health system.

In conclusion, the study highlights the nuanced relationship between PFHI and healthcare utilization among households in India, while PFHI does not appear to significantly increase hospitalization rates, it does influence the type of healthcare facilities chosen by enrolled households. Experts suggested looking into the contradictory results of study and research into its causes further.

- **Paper III: Comparative Analysis of Consumption Patterns in Women-Headed and Men-Headed Households: Insights from the Household Consumption Expenditure Survey 2022-23**
- **Discussant:** Suman Patel, ISS. Deputy Director, NSO, FOD HQ

This paper analyzes and compares the consumption patterns of women-headed households (WHH) and men-headed households (MHH) in India using data from the Household Consumption Expenditure Survey 2022-23. The study reveals that WHH generally report higher Monthly Per Capita Expenditure (MPCE) than MHH, especially in essential areas such as food, healthcare, and education. This suggests that WHH prioritize household welfare and basic needs more prominently, likely due to caregiving roles and immediate responsibilities. The data also show that education plays a significant role - educated WHH exhibit notably higher MPCE, indicating the empowerment of education on economic decision-making and spending capacity.

The findings further highlight the influence of factors like urban-rural residence, household size, income source, and marital status on expenditure patterns. Urban WHH, for instance, demonstrate broader consumption ranges compared to their rural counterparts, potentially due to better access to services and higher living costs in cities. The study emphasizes the need for gender-sensitive policies that address the unique economic challenges faced by WHH, such as improved access to healthcare, education, and livelihood opportunities.

In conclusion, the study suggested that Gender dynamics significantly shape household consumption pattern and Policies to address unique challenges faced by WHH to promote equitable development. There is a need to strengthen welfare program like direct cash transfers for vulnerable groups. Experts suggested looking into the budget share of the household in doing this exercise.

Technical Session-IV

Topic: Annual Survey of Unincorporated Sector Enterprises (ASUSE)

Chair: Sh. Salil Kumar Mukhopadhyay, ADG, Enterprise Survey Division, NSO, MoSPI and Prof. Badri Narayan Rath, IIT Hyderabad

The fourth technical session of the National Seminar featured three insightful technical papers focused on ASUSE survey data, presenting valuable findings on various economic aspects related to India's informal sector and emerging platforms.

- **Paper I: Assessing the Productivity-Investment Nexus in Informal Economies: Evidence from India**
- ➤ **Discussant:** Sonakhya Samaddar, Deputy Director, EnSD, NSO, and Ujjaval Srivastava, Deputy Director, RAU, MoSPI

The paper explored the intricate relationship between productivity and investment in the informal economy. Using weighted regression models, the study analyzed the productivity dynamics in trade, manufacturing, and services across different economic categories. Key findings highlighted the regression coefficients for productivity in these sectors, emphasizing variations in labor productivity. The presenters proposed future studies to further examine the robustness and causal inference of these relationships, providing a foundation for refining the work.

- **Paper II- Estimation of Annual Change in Inventory (CII) for the Unorganised Sector Using Two Years of ASUSE Data**
- ➤ **Discussant:** Sh. Dipankar Mitra, Deputy Director, National Accounts Division, MoSPI, and Gopal Saha, Deputy Director, Household Survey Division, MoSPI,

This paper was mainly focused on improving the estimation methods for the annual Change In Inventory (CII) in India's unorganized sector. The presentation critiqued the current methodology, which often leads to inaccuracies due to seasonal and price fluctuations, and proposed an alternative approach that compared closing inventory stocks between two ASUSE rounds (2021–22 and 2022–23). The new methodology adjusts for inflation, yielding more reliable estimates and reducing sampling errors and respondent recall bias. The findings suggest that the proposed method provides significantly more precise results, making it a sustainable and robust approach for future national accounting exercises, particularly for the unorganized sector.

- **Paper-III- Glimpses of the Platform Economy Related to App Cabs and Delivery Services**
- ➤ **Discussant:** Sh. Jugoprakash Bhattacharjee, Ex-ADG, SDRD, MoSPI.

This presentation provided an overview of India's growing gig and platform economy, focusing on app-based service providers like Ola, Uber, Zomato, and Swiggy. The study, based on microdata from recent ASUSE rounds, examined the economic and operational characteristics of these

establishments. The findings revealed that while platform-based work offers employment flexibility, it remains largely informal, with minimal regulation, limited social security, and often harsh working conditions. Additionally, the study highlighted the underrepresentation of platform workers in national surveys and the lack of dedicated classification codes in the PLFS. The paper called for improvements in data collection methodologies and a policy framework that acknowledges the significance of the platform economy in sectors like urban transport and delivery services.

In all three papers, presenters elaborated on the background, data sources, methodologies, objectives, and key findings. The discussions provided critical insights into the challenges and opportunities in India's informal economy, offering various recommendations for some improved methodologies, and a greater understanding of emerging sectors such as the gig economy. The session concluded with some question answer sessions and with a call for further research and policy development to support the unorganized sector, which are rapidly shaping the future of India's economy.

Technical session V

Topic: Annual Survey of Industries (ASI)

Chair: Sh. Salil Kumar Mukhopadhyay, ADG, Enterprise Survey Division, NSO, MoSPI and Prof. Badri Narayan Rath, IIT Hyderabad

In the session, two papers were presented and the Paper-wise highlights of presentation and deliberations (comments /suggestions) thereon are presented below:

- **Paper IV: Dynamics of contract workers in manufacturing sector in India: Evidence from ASI data**
- ➢ **Discussant:** Shri. A. K Panigrahi, Director, IS Wing, EnSD; Ankita Mondal, Assistant Director, IS Wing, EnSD & Aditya Mandal, Assistant Director, Department of Commerce, DGCIS

The presentation examines the changing role of contract workers in India's organized manufacturing sector using data from the Annual Survey of Industries (ASI) from 2011–12 to 2022–23. It focuses on two main metrics: the participation rate, which compares the share of contractual and regular workers, and the wage differential ratio, which compares wages between these groups. The findings show a notable rise in contractual employment, with the number of contract workers increasing from about 36 lakh in 2011–12 to around 59.5 lakh in 2022–23, growing at a CAGR of 4.7%. In comparison, directly employed workers grew at a slower CAGR of 2.2%. Overall, total workers in the sector rose from approximately 1.04 crore to 1.46 crore during this period. The steady increase in the share of contractual workers points to a structural shift in the labor composition of organized manufacturing in India.

- **Paper V: Supply-Use & Input-Output Tables: Using 7-digit Product-level ASI Data**
- ➢ **Discussant:** Sourish Dutta (Assistant Professor of Economics, VIPS-TC, GGSIPU, Delhi)

The presentation introduces a detailed methodology to construct high-resolution Supply-Use Tables (SUTs) and Input-Output Tables (IOTs) using 7-digit product-level data from the Annual Survey of Industries (ASI), focusing on India's mobile phone manufacturing sector (NPCMS 4722200) between 2016 and 2021. These tables provide greater detail than previous national accounts and are essential for modern economic analysis, especially in understanding global value chains (GVCs), inter-sectoral linkages, and simulating policy impacts. The approach combines ASI microdata with KLEMS and NSSO datasets, resolving classification challenges through a concordance between NPCMS and NIC codes. The transformation from rectangular SUTs to square IOTs is done using the Industry Technology Assumption, allowing the construction of use (U) and supply (V) matrices, key coefficients, and the Leontief Inverse Matrix.

Leontief-based analysis shows that Domestic Value Added (DVA) in mobile phone exports increased significantly from about 9% to 30%, while the share of Foreign Value Added (FVA) declined, indicating a strengthening domestic supply chain. Employment linked to exports surged by 411%, with notable growth in contractual jobs (+138%) and female employment (+52%). Between 2016 and 2021, the sector witnessed a 66% rise in output, a massive 554% increase in

exports, and a 41% decline in imports, reflecting strong import substitution and robust domestic value chain development.

Key findings highlight the mobile phone sector's impressive growth in output and exports, a shift toward higher domestic value creation, and a significant expansion in employment. The labor market also saw structural changes, with more contractual roles and improved gender participation, underlining the sector's broader economic and social impact.

Concluding Session:

The seminar concluded with a felicitation ceremony and the distribution of certificates to the authors of papers presented during the two-day National Seminar, as a gesture of encouragement for their future work and research.

Delivering the Concluding Remarks, Shri Pravin Srivastava, Former Secretary, MoSPI and Chief Statistician of India, appreciated the presenters and emphasized the importance of collaboration between official statisticians and critics. He noted MoSPI's introduction of a new curriculum incorporating NSS data for internal research, boosting data standards. He also highlighted innovations like AI and CAPI, which have enhanced data quality and reduced respondent burden.

The seminar concluded with a collective resolve to deepen the synergy between data producers and users, strengthen the statistical system's responsiveness, and promote evidence-based governance across sectors.

Key takeaways from the seminar:

1. The seminar brought together students, researchers, scholars from various universities and institutes across Goa, as well as representatives from user ministries, data-producing agencies, and subject experts. The aim was to foster critical discussion on the technical aspects of the survey and its findings. The discourse focused on paving a scholarly path for deeper analysis and methodological refinement. Key areas of discussion included improvements in survey methodology and schedules, the need to eliminate duplication, and the importance of comparing findings with administrative data on related indicators. The active participation and engagement of attendees over the two-day event contributed to making it a dynamic and impactful platform for knowledge exchange and future collaboration.

2. **Research Catalyst:** The seminar served as a platform to encourage collaborative future research and highlighted the significant utility of the data for both academia and user ministries. Institutions, like Goa University actively use NSS data in research, showing how NSS contributes to academic outputs aligned with NEP 2020.

3. **Promoting Integration with Administrative Data:** The integrated approach of analysing key indicators derived from survey data alongside related administrative data would help provide a more accurate picture of the actual situation. However, gaps in administrative data could lead to misinterpretations and potentially misleading policy decisions. Ministries are requested to take these factors into account when interpreting survey findings.

4. NSS complements existing systems like UDISE+, AISHE, POSHAN Tracker by providing critical data on:
   a. Adult literacy
   b. Out-of-school children
   c. NEET (Not in Education, Employment or Training) rates
   d. Dropout reasons

   This integration is vital for evidence-based, inclusive education policy planning.

5. **Innovations in analysis with NSS Data:** The seminar highlighted innovative approaches such as machine learning and neural networks, which offer advanced techniques for modeling and producing model-based estimates of key indicators. These technologies have the potential to reduce the reliance on extensive field surveys, thereby minimizing the survey burden while ensuring accuracy and consistency in data outputs. In light of their promising applications, participants suggested the need for further study and exploration in this area to better integrate such methodologies into future research and statistical systems.

6. **Milestone Moment-** 2025 marks 75 years of NSS – celebrating its long-standing contribution to India's data ecosystem.

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For more details on survey reports and upcoming statistical initiatives, please visit the official MoSPI website: www.mospi.gov.in

Watch the recorded sessions on MoSPI's YouTube Channel: @GoIStats.