



CENTER FOR  
DEVELOPMENT  
STUDIES  
DEPARTMENT OF  
ECONOMICS  
RAJIV GANDHI  
UNIVERSITY



Special Lecture Series 2022-23

Lecture 9: INDIA'S INFORMAL ECONOMY AND SOME IMPLICATIONS FOR CLIMATE CHANGE



9th March, 2023

Time: 2.45 PM

Venue: Conference Hall

### Content

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## **1.1 About Rajiv Gandhi University**

Rajiv Gandhi University (formerly Arunachal University) is the premier institution for higher education in the state of Arunachal Pradesh. Ever since its inception, the university has been trying to achieve excellence and fulfill the objectives as envisaged in the University Act. The University started functioning from 1st April, 1985. Since then Rajiv Gandhi University then Arunachal University has carved a niche for itself in the educational scenario of the country following its selection as a University with potential for excellence by a high level expert committee of University Grants Commission from among universities in India. The University was converted into a Central University with effect from 9th April 2007 as per notification of Ministry of Human Resource Development, Government of India. The University is located a top Rono Hills on a picturesque tableland of 302 acres overlooking the river Dikrong. It is 25 km away from Itanagar, the State capital.

The teaching and research programmes of the University are designed with a view to play a positive role in the socio-economic and cultural development of the State. The University offers Certificate Courses, Diploma, Post Graduate Diploma, Under Graduate, Post-Graduate and Ph.D. programmes. The Department of Education also offers B.Ed. programme. There are 45 (forty five) colleges affiliated to the University. The University has been extending educational facilities to the students from the neighboring States, particularly Assam. The strength of students in different Departments of University and in affiliated colleges has been steadily increasing. The Faculty members have been actively engaged in research activities with financial support from UGC and other funding agencies. Since its inception, a number of proposals on research projects have been sanctioned by various funding agencies to the University. The various Departments regularly organize Seminars, Workshops and Conferences. Many faculty members participated in national and international conferences and seminars held within the country and abroad. Eminent scholars and distinguished personalities have visited the University and delivered lectures on various disciplines. The academic year 2000-2001 was a year of consolidation for the University. The switch over from annual to semester system took off smoothly and the performance of the students registered a marked improvement. Various syllabi designed by Boards of Post-Graduate Studies (BPGS) have been implemented. In spite of infrastructural constraints, the University has been maintaining its academic excellence. The University has

strictly adhered to the academic calendar, conducted the examinations and declared the results in time. The students from the University have found placements not only in State and Central Government Services, but also in various institutions, industries and organizations. Many students have come out successful in the National Eligibility Test (NET). Since its inception, the University has made significant progress in teaching, research, innovations in curriculum development and developing infrastructure.

### **1.2 About the Department of Economics**

The Department of Economics made its beginning in July 1991. The main objective of the Department has been to impart socially relevant education at the Post Graduate level by judicious mix of theory and empiricism. The course of study and research offering of the department has been designed to meet this objective. The Department of Economics has the distinction of acting as the nodal Department for the preparation of the First Human Development Report (HDR) of Arunachal Pradesh. The Department also has the distinction of preparing the First State Development Report of Arunachal Pradesh. The 7th, 17th and 22nd annual Conference of the North Eastern Economic Association Conference (NEEA) was organised by the Department in 2005, 2015 and 2022 respectively. Recognizing the contributions of the Department, the Ministry of Finance, Government of India in 2012 sanctioned grant-in-aid for establishing the Centre for Development Studies (CDS) attached to the department of Economics.

### **1.3 Centre for Development Studies (CDS)**

The Centre for Development Studies (CDS) was set up in 2013 as a research adjunct at the Department of Economics, Rajiv Gandhi University (RGU), Itanagar, with a generous grant from the Ministry of Finance (Department of Economic Affairs), Government of India. The objectives of the Centre include the creation of high-quality research infrastructure for students, researchers and faculty members, in addition to sponsoring and coordinating research on various developmental issues having policy implications both at the regional and national level. Sponsoring national and international scholars for delivering lectures and other academic engagements and organizing national and international seminars, workshops, symposiums at periodic intervals on relevant topics and publishing working/policy papers on the research outcome of the Centre, monographs and edited volumes are other key activities of the Centre.

#### 1.4 CDS Special Lecture Series:

As a part of its academic activities, the Centre for Development Studies has been organising special Lecture series from time to time with the objective to inform students and researchers regarding the recent development in economics and social science research. Academicians from across the country and abroad are invited to deliver such lectures. Some of the speakers of the previous lectures were Prof. Seema Bathla, Centre for the Study of Regional Development, School of Social Sciences, JNU, New Delhi; Prof. Rajarshi Majumder Department of Economics, University of Burdwan, West Bengal; Dr. Uma Rani, The Research Department, International Labour Organization (ILO), Geneva; Dr. Ambika Aiyadurai, Department of Humanities and Social Sciences, IIT, Gandhinagar, Gujarat, Prof. Mrinal Kanti Dutta, Faculty of Humanities and Social Sciences, IIT Guwahati, Guwahati, Prof. Indranil Mukhopadhyay, Department of Human Genetics, Indian Statistical Institute, Kolkata and Prof Vinod Kumar Jain, Ex-Professor, Jawaharlal Nehru University, New Delhi and former Vice-Chancellor of Doon University and Tezpur University. This present lecture is the ninth lecture of this lecture series.


#### 2.0 Organising Committee

<b>Chief Patron</b> Prof. Saket Kushwaha Vice-Chancellor Rajiv Gandhi University		
<b>Advisor</b> Prof. Sushanta Kumar Nayak, Head, Department of Economics Rajiv Gandhi University		
<b>Organizing Chairman</b> Prof. Vandana Upadhyay Coordinator Center for Development Studies Department of Economics, Rajiv Gandhi University		
<b>Dr. Dil Bahadur Gurung</b> Assistant Professor Department of Economics, Rajiv Gandhi University	<b>Dr. Prasenjit Bujar Baruah</b> Assistant Professor Department of Economics, Rajiv Gandhi University	<b>Dr. Anup Kumar Das</b> Assistant Professor Department of Economics, Rajiv Gandhi University

### 3.0 About Special Lecture Series 2022-23: Lecture 9

3.1: Themes: Climate Change: Its Social, Political and Economic Dimensions

3.2: Details of the Resource Persons:

	<p><b>Barbara Harriss White</b> Emeritus Professor and Fellow Wolfson College, Oxford &amp; Visiting Professor Jawaharlal Nehru University, New Delhi &amp; Research Fellow Max Weber Stiftung, New Delhi</p>
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3.3: **Sponsoring Agency:** Centre for Development Studies, Department of Economics, Rajiv Gandhi University

3.4: **Expenditure Incurred:** Rs.15,000/-

### 4.0 Detail Programme:

2.45 pm- 2.50 pm	Welcome Address	Prof. Vandana Upadhyay, Coordinator Center for Development Studies, Department of Economics
2.50 pm – 2.55 pm	Brief Introduction of the Speaker	Prof. Vandana Upadhyay, Coordinator Center for Development Studies, Department of Economics
2.55 Pm- 3.40 pm	Lecture by the Speaker	<b>Barbara Harriss White</b> , Emeritus Professor and Fellow, Wolfson College, Oxford
3.40 pm- 3.45 pm	Concluding remarks by the Chair person	Prof. S. K. Nayak, Head Department of Economics, Rajiv Gandhi University
3.45 pm – 3.50 pm	Vote of Thanks	Anup Kumar Das, Assistant Professor, Department of Economics

## 5.0 Outcome of the Program

Informality is an important characteristic of Indian economy, as it employs more than 90% of the work force of the country. The theme of the presentation was India's informal economy and its implication for climate change. Outline of the talk contains:

- Informal Economy (Definition, Characteristics, Theories, Paradoxes, Trends, continuities and Changes);
- Implications of climate change in different sectors (Agriculture and intertwining, waste and indispensability, informal- criminal economy)
- Implication of climate change about (over and underestimating Indian economics, environmental impact, whether Indian economy innovates for carbon transition and the Indian economy and the state).

The presentation is divided into two parts. The first part was on India's informal economy, where, she regarded informal economy as 'the economy that lies outside the state regulation', for example unlicensed firms. It is huge in size in terms of both employability (93%) and GDP (60%). It is diverse in nature which includes agriculture, classes of labour, occupation from bonded labour to family business, different enterprises and so on. The speaker discussed different theories of informal economy such as Hart's definition, ILO definition, Altvater's surplus labour theory, Margit and Kar's labour laws, De Soto's entrepreneurial sector and Sanyal's subsistence economy model. She also identified some paradoxes, in the form of poverty and the existence. She also showed the dynamics i.e., the continuity and changes of the informal economy in the 21<sup>st</sup> century.


The second part was on the implication of informal economy for climate change. In this regard, she raised some important questions. The first question was about the scope of future research on agricultural production and distribution system, and its effect on greenhouse gases, cost-benefit analysis, labour, energy and water. The second question was on the role of Indian economy in case of generating waste. It was found that informal economy is essential for circulation of waste. The third question was on the relationship between criminality and environment. The fourth question was raised on informal economy and the climate change. She stated that informal economy has significant impact on climate change and the environment. Though literatures suggested that informal economy has negative impact on environment but the extent of this relationship is uncertain. The fifth question put forward by her was innovative capacity of the Indian economy to embark on a low carbon transition. Here, she found some research gaps. The

last question raised by her was whether India can work on a project related to informal economy. She found few project on informal sector in India i.e. National Commission for Enterprises in Unorganised Sector (NCEUS).

The summary of the study states that Indian economy is mostly represented by informal economy. It was also found that informal economy significantly contributed to the emission of GHGs. But little work has been done till date on the informal economy and the climate change or environment. Therefore, she suggested for a vast agenda for field research on informal economy and the environment or the climate change.

## 6.0 Annexure

### 6.1: Brochure:

	<p>RAJIV GANDHI UNIVERSITY CENTER FOR DEVELOPMENT STUDIES DEPARTMENT OF ECONOMICS Special Lecture Series 2022-23 <b>Lecture 9: INDIA'S INFORMAL ECONOMY AND SOME IMPLICATIONS FOR CLIMATE CHANGE</b></p>	
<p>9<sup>th</sup> March, 2023 Time: 2.45 PM Venue: Conference Hall, Department of Economics</p>		
<p><b>Chief Patron</b> <b>Prof. Saket Kushwaha</b> Vice-Chancellor Rajiv Gandhi University</p>	<p><b>Resource Person</b> <b>Barbara Harriss White</b> Emeritus Professor and Fellow, Wolfson College, Oxford &amp; Visiting Professor, JNU, New Delhi &amp; Research Fellow Max Weber Stiftung, New Delhi</p>	<p><b>Advisor</b> <b>Prof. Sushanta Kumar Nayak</b> Head, Department of Economics</p>
<p><b>Organizing Chairman</b> <b>Prof. Vandana Upadhyay</b> Coordinator Center for Development Studies</p>		



### Organizing Secretaries

**Dr. Dil Bahadul Gurung**  
Assistant Professor  
Department of  
Economics, RGU

**Dr. Prasenjit Bujar Baruah**  
Assistant Professor  
Department of Economics, RGU

**Dr. Anup Kumar Das**  
Assistant Professor  
Department of Economics,  
RGU

### About the Speaker:



Barbara Harriss-White has been studying India since driving from Cambridge to Delhi in 1969. A field- and political economist, her main interests have been in rural markets, informal capitalism and dimensions of deprivation. She directed Queen Elizabeth House and founded Oxford's M Phil in Development Studies and the Contemporary South Asian Studies Programme, mentored 80 PhDs and post-docs. Now, she studies the economy and its waste, and agriculture. Recent (edited/co-edited) books: *Middle India and urban-rural development* (2016); *The Wild East: criminal political economies in South Asia* (2019); *Rethinking markets in modern India* (2020); *Agricultural market reforms and farmer protests in India* (2021); *Gold in India* (forthcoming).

## 6.2: Photographs:





6.3: List of Attendance:



**RAJIV GANDHI UNIVERSITY**  
 CENTER FOR DEVELOPMENT STUDIES DEPARTMENT OF ECONOMICS  
 Special Lecture Series 2022-23  
**Lecture 9: Informal Economy and Some Implications for Climate Change**  
**9th March, 2023**  
 Time: 11.30 AM, Venue: Conference Hall Department of Economics

Attendance

SL No.	Name	Designation	Signature
1.	Dr. Hjum Noshi	Assoc. Professor	<i>[Signature]</i>
2.	MUMTAK BOKO	student	M. BOKO
3.	Tengia Brema	student	<i>[Signature]</i>
4.	Rituparna Datta	PhD Research Scholar	<i>[Signature]</i>
5.	Tanalisia Deori	student	S. Deori
6.	Debashri Borah	student	DBorah
7.	Korlom Mossang	PhD scholar	<i>[Signature]</i>
8.	Hemsi Pulu	scholar	<i>[Signature]</i>
9.	Riya Kado	"	<i>[Signature]</i>
10.	Sudesh Bagan	2nd semester	<i>[Signature]</i>
11.	Anoop Ama	"	<i>[Signature]</i>
12.	Deviy Nizk	4th semester	<i>[Signature]</i>
13.	Tenzin Dargay	4th "	<i>[Signature]</i>
14.	Shimron Basang	4th "	<i>[Signature]</i>
15.	Mukul Konch	4th "	<i>[Signature]</i>
16.	Tenzin Wangchuk	4th "	<i>[Signature]</i>
17.	Joshi Rokej	" "	<i>[Signature]</i>
18.	Kaback Juni	" "	<i>[Signature]</i>
19.	HIBU AKU	"	<i>[Signature]</i>
20.	ARTI KUMARI	4th Semester	<i>[Signature]</i>
21.	RINCHIN DORJEE	2nd Sem	<i>[Signature]</i>
22.	Jumde Naso	4th Sem	<i>[Signature]</i>
23.	Ashly Boko	2nd Sem	ABOKO
24.	TECH VAZAR	2nd Sem	T. Vazar
25.	Pakpi Nada	4th Sem	<i>[Signature]</i>

26.	Isium Boje	4th sem	Bumi
27.	Vandana Upadhyay	Professor	@Upadhyay
28.	Radhika Tiwari	2nd Sem	Rowang
29.	S.K. Nayak	Head	9/13/22
30.	Ashi Lakshmi	Asst. Prof	9/13/22
31.	Vani Devi	2nd semester	Yamundee
32.	Yajie Techi Tava	4th semester	Chennai
33.	Chauhari	"	Chennai
34.	PINGOM BAGRA	"	Shri
35.	Kanchan Veri	Asst. Prof	Shri
36.	Dhanu Nair	6th Semester	Chennai
37.	Suresh Kumar	Phd Scholar	Suresh Kumar
38.	Kangkim Moyand	2nd sem	Haukeim
39.	Kagan Lego	4th sem	Hago
40.	Chingem Telen	4th Sem	Chingem
41.	Kexet Gankak	2nd sem.	Chingem
42.	NALU TASUNO	4th Sem.	N. T.
43.	NOTUN BORANGI	4th sem	N. Borangi
44.	Khoda Anjo	2nd Sem	- Anjo
45.	Kalom Tamuk	2nd sem	Kalom
46.	Pema Khandu	2nd sem	Pema
47.	Mita Meyong	1st sem	Mita
48.	D.B. Gurung	Asst. Professor	D. B. Gurung
49.	Mingyue Dake	2nd Semester	M. Dake
50.	Ogyansu Jayang	2nd Semester	Ogyansu
51.	Pani Mangku	2nd Semester	Pani
52.	Tales Tabal	2nd "	Tales
53.	Kanpi Basak	"	Kanpi
54.	Sumbi Deyu	"	Sumbi
55.	Ribati Borah	"	Ribati
56.	Rindun Dharma	4th semester	Rindun
57.	Habung Relma	"	Habung
58.	Ipu Kalyu	"	Ipu
59.	Tanjun Dolma	"	Tanjun
60.	Labrang Thamu	2nd semester	L. Thamu
61.	Anup K. D.	Asst. Prof	Anup
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@Upadhyay

Coordinator, Centre for Development Studies  
Department of Economics  
Rajiv Gandhi University





CENTER FOR  
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RAJIV GANDHI  
UNIVERSITY



Special Lecture Series 2022-23

**Lecture: 8: The Informal Economy, Self-Employment and Petty Production – Framing  
Macro and Micro Political Economy**



7th March, 2023  
Time: 2.45 PM  
Venue: Conference Hall

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## **1.1 About Rajiv Gandhi University**

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#### 2.0 Organising Committee

<b>Chief Patron</b> Prof. Saket Kushwaha Vice-Chancellor Rajiv Gandhi University		
<b>Advisor</b> Prof. Sushanta Kumar Nayak, Head, Department of Economics Rajiv Gandhi University		
<b>Organizing Chairman</b> Prof. Vandana Upadhyay Coordinators Center for Development Studies Department of Economics, Rajiv Gandhi University		
<b>Dr. Dil Bahadur Gurung</b> Assistant Professor Department of Economics, Rajiv Gandhi University	<b>Dr. Prasenjit Bujar Baruah</b> Assistant Professor Department of Economics, Rajiv Gandhi University	<b>Dr. Anup Kumar Das</b> Assistant Professor Department of Economics, Rajiv Gandhi University

### 3.0 About Special Lecture Series 2022-23: Lecture 8

3.1: **Themes: The Informal Economy, Self-Employment and Petty Production – Framing Macro and Micro Political Economy**

3.2: **Details of the Resource Persons:**

	<p style="text-align: center;"><b>Barbara Harriss White</b> Emeritus Professor and Fellow Wolfson College, Oxford &amp; Visiting Professor Jawaharlal Nehru University, New Delhi &amp; Research Fellow Max Weber Stiftung, New Delhi</p>
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3.3: **Sponsoring Agency:** Centre for Development Studies, Department of Economics, Rajiv Gandhi University

3.4: **Expenditure Incurred:** Rs.15,000/-

#### 4.0 Detail Programme:

2.45 pm- 2.50 pm	Welcome Address	Prof. Vandana Upadhyay, Coordinator Center for Development Studies, Department of Economics
2.50 pm – 2.55 pm	Brief Introduction of the Speaker	Prof. Vandana Upadhyay, Coordinator Center for Development Studies, Department of Economics
2.55 Pm- 3.40 pm	Lecture by the Speaker	<b>Barbara Harriss White</b> , Emeritus Professor and Fellow, Wolfson College, Oxford
3.40 pm- 3.45 pm	Concluding remarks by the Chair person	Prof. S. K. Nayak, Head Department of Economics, Rajiv Gandhi University
3.45 pm – 3.50 pm	Vote of Thanks	Dr. Dil Bahadur Gurung, Assistant Professor, Department of Economics

## 5.0 Outcome of the Program

The lecture comprises of four different parts:

- Macro theories of informality and new developments in informal development
- Micro: theories of self-employment and petty commodity production
- Application to India
- Normative and Positive questions of developments



In the first part, six approaches to informality was discussed. According to the first approach i.e. the **dualist theory** informal activity exists in the forms of production (characterised by easy entry, small scale and labour intensiveness). But such activities are residual activities and transitory in nature; which will disappear once the economy moves from the developing to a developed economy. According to **legalist theory**, the informal sector is composed of self-reliant micro-entrepreneurs *choosing* to operate informally in order to avoid the costs associated with registered activity; where the dis-incentive is the insecure property rights. The adverse cost-benefit relations attributed to ‘inefficient’ regulatory interventions by the state incentivise pre-emptive development. According to the **structuralist theory** the inter-dependence of formal and informal activity, one that is exploitative of labour. Informality ceases to be a transitory feature of a segment of the economy, and is a necessity for the capitalist system as a whole. The **labourist theory** talks about the distinctive and persistent labour relations. Many formal sector firms employ workers on contact basis without any social security benefits. Sometimes they outsourced their activities to other private parties. Similarly, people are forced to become self-employed as they are unable to have a job in the formal sector. It may be due to capital biased industrial development (unable to absorb surplus labour). Moreover, it is not a temporary in nature. The **urban studies** observe the informal sector from the point of view of informal housing, settlements and land markets subfield etc. In India those activities lie outside the purview of the organised sector are known as **unorganised sector**. Here, unorganised sector means those enterprises which are not registered under specific act of the country. Although some enterprises in the unorganised sector are with their formalized business (although unregistered), majority are purely informal in nature.

Some micro theories of self-employment and petty commodity production (PCP) were discussed in the second part of the lecture. In the third and fourth part, applications of these theories and approaches to India, and some normative and positive questions were explained. Five recent advances or changes in the theory and research for the informal economy were also discussed.

Finally, she discussed about the entire scenario of India's informal economy, where more than 90 per cent of the workforce are unregistered or unorganized and half of the formal workforce is informal. As many as 80 per cent workers in agricultural sector are self-employed, and 72 per cent of the enterprises in the non-agricultural sector are own account enterprises. All of them are unorganized or informal. There is incomplete primitive accumulation and day by day agricultural GDP is going to downturn. If we see the aforementioned problems from political point of view, we find that no political party talks about the problems of this sector. In the final part of the study, some development questions and India's answer to these development questions were discussed.

## 6.0 Annexure

### 6.1: Brochure:

	<p>RAJIV GANDHI UNIVERSITY          CENTER FOR DEVELOPMENT STUDIES          DEPARTMENT OF ECONOMICS          Special Lecture Series 2022-23  <b>Lecture 8: India's Informal Economy and          Some Implications for Climate Change</b></p>	
<p>7<sup>th</sup> March, 2023          Time: 2.45 PM Venue: Conference Hall,          Department of Economics</p>		
<p><b>Chief Patron</b>          Prof. Saket Kushwaha          Vice-Chancellor          Rajiv Gandhi University</p>	<p><b>Resource Person</b>  <b>Barbara Harriss White</b>          Emeritus Professor and Fellow,          Wolfson College, Oxford &amp;          Visiting Professor, JNU, New Delhi &amp;          Research Fellow          Max Weber Stiftung, New Delhi</p>	<p><b>Advisor</b>          Prof. Sushanta Kumar Nayak          Head, Department of          Economics</p>
<p><b>Organizing Chairman</b>          Prof. Vandana Upadhyay          Coordinators Center for          Development Studies</p>		
<p><b>Organizing Secretaries</b></p>		
<p>Dr. Dil Bahadul Gurung          Assistant Professor          Department of          Economics, RGU</p>	<p>Dr. Prasenjit Bujar Baruah          Assistant Professor          Department of Economics, RGU</p>	<p>Dr. Anup Kumar Das          Assistant Professor          Department of Economics,          RGU</p>

### About the Speaker:



Barbara Harriss-White has been studying India since driving from Cambridge to Delhi in 1969. A field- and political economist, her main interests have been in rural markets, informal capitalism and dimensions of deprivation. She directed Queen Elizabeth House and founded Oxford's M Phil in Development Studies and the Contemporary South Asian Studies Programme, mentored 80 PhDs and post-docs. Now, she studies the economy and its waste, and agriculture. Recent (edited/co-edited) books: *Middle India and urban-rural development* (2016); *The Wild East: criminal political economies in South Asia* (2019); *Rethinking markets in modern India* (2020); *Agricultural market reforms and farmer protests in India* (2021); *Gold in India* (forthcoming).

### 6.2: Photographs:






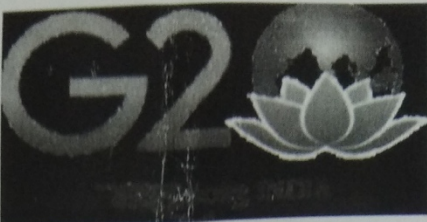
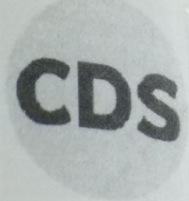








6.3: List of Attendance:

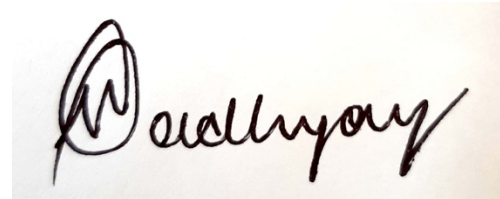




**RAJIV GANDHI UNIVERSITY**  
 CENTER FOR DEVELOPMENT STUDIES DEPARTMENT OF ECONOMICS  
 Special Lecture Series 2022-23  
**Lecture 8: THE INFORMAL ECONOMY, SELF-EMPLOYMENT AND PETTY  
 PRODUCTION – FRAMING MACRO AND MICRO POLITICAL ECONOMY**  
**7th March, 2023**  
 Time: 2:45 PM, Venue: Conference Hall Department of Economics

Attendance

SL No.	Name	Designation	Signature
1.	D. B. Gurung	Asst. Prof	<i>[Signature]</i>
2.	N. Vikramchandra Singh	Asst. Prof	<i>[Signature]</i>
3.	Rituparna Datta	PhD Research Scholar	<i>[Signature]</i>
4.	Konchom Devi	PhD Scholar	<i>[Signature]</i>
5.	Karlam Mossang	PhD Scholar	<i>[Signature]</i>
6.	Hansi Pulu	PhD Scholar	<i>[Signature]</i>
7.	Lobsang Lhamu	2 <sup>nd</sup> Semester	<i>[Signature]</i>
8.	Asha Lego	4 <sup>th</sup> Semester	<i>[Signature]</i>
9.	Geeta Nath	1 <sup>st</sup> Semester	<i>[Signature]</i>
10.	Riya Kachu	Ph.D Scholar	<i>[Signature]</i>
11.	Mummy Tara	2 <sup>nd</sup> Sem	<i>[Signature]</i>
12.	Yami Devi	2 <sup>nd</sup> Semester	<i>[Signature]</i>
13.	Mr. Pinbam Bagra	4 <sup>th</sup> Semester	<i>[Signature]</i>
14.	" Bijan Bole	" "	<i>[Signature]</i>
15.	Ms. Teter Paha	2 <sup>nd</sup> Semester	<i>[Signature]</i>
16.	Mr. Pami Pini	4 <sup>th</sup> Semester	<i>[Signature]</i>
17.	Ms. Kangkim Morong	2 <sup>nd</sup> Semester	<i>[Signature]</i>
18.	Mr. Chikamjib Horzankar	2 <sup>nd</sup> Semester	<i>[Signature]</i>
19.	Saman Kachon	PhD Scholar	<i>[Signature]</i>
20.	Taron Assoeme	"	<i>[Signature]</i>
21.	Sudeep Barman	as student	<i>[Signature]</i>
22.	Khoda Anjo	2 <sup>nd</sup> semester	<i>[Signature]</i>
23.	Kasa Lego	2 <sup>nd</sup> semester	<i>[Signature]</i>
24.	Bakom Ribza	4 <sup>th</sup> semester	<i>[Signature]</i>
		2 <sup>nd</sup> semester	<i>[Signature]</i>

25.	Punam Gamelin	4 <sup>th</sup> Semester	Dzab
26.	Ipu Koyu	4 <sup>th</sup> Sem	P. Koyu
27.	Charu Mami	4 <sup>th</sup> Sem	Charu
28.	Tap Yapan	4 <sup>th</sup> Semester	Tap
29.	Yajit Reddy Tanna	4 <sup>th</sup> Semester	Yajit
30.	Nito Moyong	4 <sup>th</sup> Semester	Nito
31.	Tupu Kambar	4 <sup>th</sup> Sem.	Tupu
32.	Habing Reema.	4 <sup>th</sup> Semester.	Habing
33.	Kekde Gamkar	II semester	Kekde
34.	Bau Jyi	2 <sup>th</sup> Semester	Bau
35.	Padma Bahadur Chetry	4 <sup>th</sup> semester	Padma Bah. Chetry
36.	MUMTAK BOKO	4 <sup>th</sup> semester	M. BOKO
37.	Rinclin Dharma	4 <sup>th</sup> semester	R. Dharma
38.	TENZIN DOLMA	"	Tenzin
39.	Tenzin Drema	"	Tenzin
40.	DELVIND KUMAR YADAV	Companee	Delvind
41.	Pabitra Borah	Ph.D. Scholar	P. Borah
42.	Rinclin Dharma	2 <sup>nd</sup> Sem	Rinclin
43.	Anup K. Dey	Asst. Prof.	Anup
44.	ASHP Lama	Associate prof.	ASHP
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Coordinator, Centre for Development Studies  
 Department of Economics  
 Rajiv Gandhi University





CENTER FOR  
DEVELOPMENT STUDIES  
DEPARTMENT OF  
ECONOMICS  
RAJIV GANDHI  
UNIVERSITY



Special Lecture Series 2022-23

Lecture 5: Data Science: Old Wine in a New Bottle



14<sup>th</sup> September, 2022

Time: 2.45 PM Venue: Conference Hall

### Content

<b>Sl. No.</b>	<b>Topic</b>	<b>Page Number</b>
1.1	About Rajiv Gandhi University	3
1.2	About the Department of Economics	4
1.3	Centre for Development Studies (CDS)	4
1.4	CDS Special Lecture Series	4
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3.0	About Special Lecture Series	6
3.1	Theme: Data Science: Old Wine in a New Bottle	6
3.2	Details of the Resource Persons	6
3.3	Sponsoring Agency	6
3.4	Expenditure Incurred	6
4.0	Detail Programme	6
5.0	Outcome of the Program (Main points of the Lecture)	7
6.0	Annexure	8
6.1	Brochure	8
6.2	Photographs	9
6.3	List of Attendance	10



## **1.1 About Rajiv Gandhi University**

Rajiv Gandhi University (formerly Arunachal University) is the premier institution for higher education in the state of Arunachal Pradesh. Ever since its inception, the university has been trying to achieve excellence and fulfill the objectives as envisaged in the University Act. The University started functioning from 1st April, 1985. Since then Rajiv Gandhi University then Arunachal University has carved a niche for itself in the educational scenario of the country following its selection as a University with potential for excellence by a high-level expert committee of University Grants Commission from among universities in India. The University was converted into a Central University with effect from 9th April 2007 as per notification of Ministry of Human Resource Development, Government of India. The University is located a top Rono Hills on a picturesque tableland of 302 acres overlooking the river Dikrong. It is 25 km away from Itanagar, the State capital.

The teaching and research programmes of the University are designed with a view to play a positive role in the socio-economic and cultural development of the State. The University offers Certificate Courses, Diploma, Post Graduate Diploma, Under Graduate, Post-Graduate and Ph.D. programmes. The Department of Education also offers B.Ed. programme. There are 45 (forty five) colleges affiliated to the University. The University has been extending educational facilities to the students from the neighboring States, particularly Assam. The strength of students in different Departments of University and in affiliated colleges has been steadily increasing. The Faculty members have been actively engaged in research activities with financial support from UGC and other funding agencies. Since its inception, a number of proposals on research projects have been sanctioned by various funding agencies to the University. The various Departments regularly organize Seminars, Workshops and Conferences. Many faculty members participated in national and international conferences and seminars held within the country and abroad. Eminent scholars and distinguished personalities have visited the University and delivered lectures on various disciplines. The academic year 2000-2001 was a year of consolidation for the University. The switch over from annual to semester system took off smoothly and the performance of the students registered a marked improvement. Various syllabi designed by Boards of Post-Graduate Studies (BPGS) have been implemented. In spite of infrastructural constraints, the University has been maintaining its academic excellence. The University has strictly adhered to the academic calendar, conducted the examinations and declared the results in time. The students from the University have found placements not only in State and Central Government Services, but also in various

institutions, industries and organizations. Many students have come out successful in the National Eligibility Test (NET). Since its inception, the University has made significant progress in teaching, research, innovations in curriculum development and developing infrastructure.

### **1.2 About the Department of Economics**

The Department of Economics made its beginning in July 1991. The main objective of the Department has been to impart socially relevant education at the Post Graduate level by judicious mix of theory and empiricism. The course of study and research offering of the department has been designed to meet this objective. The Department of Economics has the distinction of acting as the nodal Department for the preparation of the First Human Development Report (HDR) of Arunachal Pradesh. The Department also has the distinction of preparing the First State Development Report of Arunachal Pradesh. The 7th, 17th and 22nd annual Conference of the North Eastern Economic Association Conference (NEEA) was organised by the Department in 2005, 2015 and 2022 respectively. Recognizing the contributions of the Department, the Ministry of Finance, Government of India in 2012 sanctioned grant-in-aid for establishing the Centre for Development Studies (CDS) attached to the department of Economics.

### **1.3 Centre for Development Studies (CDS)**

The Centre for Development Studies (CDS) was set up in 2013 as a research adjunct at the Department of Economics, Rajiv Gandhi University (RGU), Itanagar, with a generous grant from the Ministry of Finance (Department of Economic Affairs), Government of India. The objectives of the Centre include the creation of high-quality research infrastructure for students, researchers and faculty members, in addition to sponsoring and coordinating research on various developmental issues having policy implications both at the regional and national level. Sponsoring national and international scholars for delivering lectures and other academic engagements and organizing national and international seminars, workshops, symposiums at periodic intervals on relevant topics and publishing working/policy papers on the research outcome of the Centre, monographs and edited volumes are other key activities of the Centre.

### **1.4 CDS Special Lecture Series:**

As a part of its academic activities, the Centre for Development Studies has been organising special Lecture series from time to time with the objective to inform students and researchers regarding the recent development in economics and social science research. Academicians from across the country and abroad are invited to deliver such lectures. Some of the speakers of the previous lectures were Prof. Seema Bathla, Centre for the Study of Regional Development, School of Social Sciences, JNU, New Delhi; Prof. Rajarshi Majumder Department of Economics, University of Burdwan, West Bengal; Dr. Uma Rani, The Research Department, International Labour

Organization (ILO), Geneva; Dr. Ambika Aiyadurai, Department of Humanities and Social Sciences, IIT, Gandhinagar, Gujarat, and Prof. Mrinal Kanti Dutta, Faculty of Humanities and Social Sciences, IIT Guwahati, Guwahati. This present lecture is the Fifth lecture of this lecture series.


## 2.0 Organising Committee

<p style="text-align: center;"><b>Chief Patron</b> Prof. Saket Kushwaha Vice-Chancellor Rajiv Gandhi University</p>
<p style="text-align: center;"><b>Patron</b> Prof. Amitava Mitra Pro Vice-Chancellor Rajiv Gandhi University</p>
<p style="text-align: center;"><b>Organizing Chairman</b> Prof. Vandana Upadhyay Head, Department of Economics Coordinator Center for Development Studies</p>
<p style="text-align: center;"><b>Organizing Secretaries</b> Dr. Prasenjit Bujar Baruah Assistant Professor Department of Economics, RGU &amp; Dr. Anup Kumar Das Assistant Professor Department of Economics, RGU</p>

### 3.0 Special Lecture Series 2022-23: Lecture 5

#### 3.1: Theme: Data Science: Old Wine in a New Bottle

#### 3.2: Details of the Resource Persons:

	<p><b>Indranil Mukhopadhyay</b> Professor and former Head, Department of Human Genetics, Indian Statistical Institute, Kolkata</p>
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3.3: Sponsoring Agency: Centre for Development Studies, Department of Economics, Rajiv Gandhi University

3.4: Expenditure Incurred: Rs.4700/-

#### 4.0 Details Programme:

2.45 pm- 2.50pm	Welcome Address	Prasenjit Bujar Baruah, Assistant Professor, Department of Economics
2.50 pm– 2.55pm	Brief Introduction of the Speaker	Prof. Vandana Upadhyay, Head, Department of Economics & Coordinator Center for Development
2.55 Pm- 3.40 pm	Lecture by the Speaker	Indranil Mukhopadhyay, Professor and former Head, Department of Human Genetics, Indian Statistical Institute, Kolkata
3.40 pm- 3.45 pm	Concluding remarks by the Chair person	Prof. Amitava Mitra, Pro Vice-Chancellor Rajiv Gandhi University
3.45pm- 3.50 pm	Vote of Thanks	Anup Kumar Das, Assistant Professor, Department of Economics

## 5. Outcome of the Program (Main points of the Lecture)

The session started with the welcome address given by Dr. Prasenjit Bujar Baruah, Assistant Professor, Department of Economics. Thereafter, Prof. Vandana Upadhyay, Head, Department of Economics and Coordinator Centre for Development Study introduced the speaker to the audience.

Prof. Mukhopadhyay started with the point that there is no difference between data science and statistics; as statistics itself by definition is the collection, tabulation, classification and analysis of data. However, the scope of the study of statistics/ data science has widen over the years. He stated that everyone analyses data in their day to day life. For example, a village old man while crossing the road also analyses data (unknowingly) regarding the speed of the cars plying in the road before crossing it. Similarly, a driver, also analyses data while driving a car.

Prof. Mukhopadhyay added that data is a precious asset for any organization. It helps firms understand and enhance their processes, thereby saving time and money. Wastage of time and money, for example in case of a terrible advertising decision, can deplete resources and severely impact a business. The efficient use of data enables businesses to reduce such wastage by analyzing different marketing channels' performance and focusing on those offering the highest rate of return. Thus, a company can progress without increasing its advertising expenditure. However, data is meaningless until its conversion into valuable information. Data Science involves mining large data sets, containing structured and unstructured data and identifying hidden patterns to extract actionable insights. The importance of data science lies in its innumerable uses that range from daily activities to more complex applications like operating a self-driving car. The interdisciplinary field of data science encompasses computer science, statistics, inference, machine learning etc. Prof. Mukhopadhyay stated that along with the knowledge of computer and technology, common sense or reasoning capacity is very important for a data scientist.

After the completion of the lecture, there was a interactive session. Prof. Mukhopadhyay encouraged the students and the researchers to ask questions. One of the students from MSc statistics asked about the various courses in data science. Replying to this question Prof. Mukhopadhyay said that being a student of MSc statistics, one need not to do any course in data science; however, he/she may take some training in computer programming. He added that a data scientist need not take training in computer software. A data scientist should be able to develop various softwares for other users. He informed the audience that there are huge demand and employment opportunities for the data scientists.

After that Prof. Amitava Mitra, Pro- Vice Chancellor, Rajiv Gandhi University who was the chairperson of that session gave his concluding remarks. The session concluded with a vote of thanks by Dr. Anup Kumar Das, Assistant Professor, Department of Economics, Rajiv Gandhi University.

## 6. Annexure

### 6.1: Brochure:

	<p>RAJIV GANDHI UNIVERSITY CENTER FOR DEVELOPMENT STUDIES DEPARTMENT OF ECONOMICS Special Lecture Series 2022-23 <b>Lecture 5: Data Science: Old Wine in a New Bottle</b></p>	
<p>14<sup>th</sup> September, 2022 Time: 2.45 PM Venue: Conference Hall</p>		
<p>Chief Patron Prof. Saket Kushwaha Vice-Chancellor Rajiv Gandhi University</p>	<p>Resource Person Indranil Mukhopadhyay Professor and former Head, Department of Human Genetics, Indian Statistical Institute, Kolkata</p>	<p>Patron Prof. Amitava Mitra Pro Vice-Chancellor Rajiv Gandhi University</p>
<p><b>Organizing Chairman</b> Prof. Vandana Upadhyay Head, Department of Economics Coordinators Center for Development Studies</p>		
<p>Dr. Prasenjit Bujar Baruah Assistant Professor Department of Economics, RGU</p>	<p><b>Organizing Secretaries</b></p>	<p>Dr. Anup Kumar Das Assistant Professor Department of Economics, RGU</p>
<p><b>About the Speaker:</b></p>		
	<p><b>INDRANIL MUKHOPADHYAY</b> is a Professor and former Head of Human Genetics Unit at the Indian Statistical Institute where he has been a faculty member since 2008. Prof. Mukhopadhyay completed his post-graduation and received Ph.D. from University of Calcutta. He pursued his research interests in Time Series Analysis for his doctoral work with Prof. Adhir Kumar Basu. After a stint of teaching in the Statistics Department at St. Xavier's College in Kolkata and University of Burdwan, he went to the USA to study Statistical Genetics and</p>	

Genomics as a post-doctoral fellow with Prof. Daniel E. Weeks at the Department of Human Genetics, University of Pittsburgh. Indranil has authored more than 50 papers, all published in reputed international journals. His versatility extends to many areas of data science including times series analysis, statistical genomics, single cell data analysis, data integration, machine learning, statistical inference, public health etc. His work on how to control the spread of COVID-19 and how to determine the number and duration of lockdown hit the news (Times of India) immediately. Prof. Mukhopadhyay visited various international institutes and universities like Harvard University, University of California at Davis, University of Missouri, National University of Singapore, Agro Paris-Tech, INRIA, France, Glasgow University, International Centre for Theoretical Physics at Trieste, Italy etc.

## 6.2: Photographs:





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6.3 Attendance List:

<u>Attendance Sheet</u>				<u>14-09-2022</u>
<u>Sl.No.</u>	<u>Name</u>	<u>Dept.</u>		<u>Sig</u>
1.	Dr. N. V. Singh	Statistics		<u>Sig</u>
2.	Tenzin Dargy	Economics		<u>Tenzin</u>
3.	Souam Jasli	Economics		<u>Souam</u>
4.	Tomi Jini	"		
5.	Pinbon Basra	"		<u>Pinbon</u>
6.	Dimpal Pratim Gogoi	Statistics		<u>Dimpal</u>
7.	Kanchan Devi	Economics		<u>Kanchan</u>
8.	Piya Kudu	Economics		<u>Piyakudu</u>
9.	Zashi Lamu	Economics		<u>Zashi</u>
10.	Pabitra Borah	Economics		<u>P. Borah</u>
11.	Tenzin Dreng	Economics		<u>Tenzin</u>
12.	Tsering Wangchuk	Economics		<u>Tsering</u>
13.	Asha Lego	Economics		<u>Asha</u>
14.	Pakpu Gako	Economics		<u>Pakpu</u>
15.	Charu Moni	Economics		<u>Charu</u>
16.	Jumde Nado	Economics		<u>J. Nado</u>
17.	Hundi Pulu	Economics		<u>Hundi</u>
18.	Konton Motang	Economics		<u>Konton</u>

Sr. no	Name	Dept	Sign
19	Geeta Nath	Economics	<u>Geetanath</u>
20	Taralisa Deou	Economics	T. Deou
(21)	Padma Bahadur Chetry	Economics	<u>Padma Bah. Chetry</u>
(22)	NONOM Tazeng	Economics	<u>NONOM</u>
(23)	D B Gumm	do	<u>D B Gumm</u>
24	Upasana Saitia	Dept of Statistics	<u>Upasana</u>
25	Dr. Shri Shri Jayathi Nath	Dept. of Statistics	<u>Shri Jayathi Nath</u>
26	Himangshu Handique	Dept of Statistics	<u>Himangshu</u>
27	Yaje Teeli Tava	Dept. of Economics	<u>Yaje Teeli</u>
28	Linko Nija	Dept. of Commerce.	<u>Linko Nija</u>
29	Kiyang Paron	Statistics	<u>Kiyang Paron</u>
30	Gayatri Gogoi	Economics	<u>Gayatri Gogoi</u> 14/09/22
31	Sandini Saran	STATISTICS	<u>Sandini Saran</u> 14/09/2022
32	Prasojit Bejor Bena	Economics	<u>Prasojit Bejor Bena</u> 14/9/22
33	Vandana Upadhyay	Economics	<u>Vandana Upadhyay</u> 14/9/2022

Vandana Upadhyay

Coordinator, Centre for Development Studies  
Department of Economics  
Rajiv Gandhi University



**CENTER FOR  
DEVELOPMENT  
STUDIES  
DEPARTMENT OF  
ECONOMICS  
RAJIV GANDHI  
UNIVERSITY**



**Special Lecture Series 2022-23**

**Lecture 7: Climate Change: Its Social, Political and Economic Dimensions**



**15th September, 2022  
Time: 11.30 AM  
Venue: Conference Hall**

## Content

<b>Sl. No.</b>	<b>Topic</b>	<b>Page Number</b>
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3.0	About Special Lecture Series	6
3.1	Themes: Climate Change: Its Social, Political and Economic Dimensions	6
3.2	Details of the Resource Persons	6
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### **1.4 CDS Special Lecture Series:**

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Organization (ILO), Geneva; Dr. Ambika Aiyadurai, Department of Humanities and Social Sciences, IIT, Gandhinagar, Gujarat, Prof. Mrinal Kanti Dutta, Faculty of Humanities and Social Sciences, IIT Guwahati, Guwahati and Prof. Indranil Mukhopadhyay, Department of Human Genetics, Indian Statistical Institute, Kolkata. This present lecture is the seventh lecture of this lecture series.

## 2.0 Organising Committee

<p style="text-align: center;"><b>Chief Patron</b> Prof. Saket Kushwaha Vice-Chancellor Rajiv Gandhi University</p>
<p style="text-align: center;"><b>Patron</b> Prof. Amitava Mitra Pro Vice-Chancellor Rajiv Gandhi University</p>
<p style="text-align: center;"><b>Organizing Chairman</b> Prof. Vandana Upadhyay Head, Department of Economics Coordinators Center for Development Studies</p>
<p style="text-align: center;"><b>Organizing Secretaries</b> Dr. Prasenjit Bujar Baruah Assistant Professor Department of Economics, RGU &amp; Dr. Anup Kumar Das Assistant Professor Department of Economics, RGU</p>



### 3.0 About Special Lecture Series 2022-23: Lecture 7

3.1: Themes: Climate Change: Its Social, Political and Economic Dimensions

3.2: Details of the Resource Persons:

	<p>Prof Vinod Kumar Jain Ex-Professor, Jawaharlal Nehru University, New Delhi and former Vice-Chancellor of Doon University and Tezpur University</p>
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3.3: Sponsoring Agency: Centre for Development Studies, Department of Economics, Rajiv Gandhi University

3.4: Expenditure Incurred: Rs.12,000/-

#### 4.0 Detail Programme:

11.45 am- 11.50am	Welcome Address	Prof. Vandana Upadhyay, Head, Department of Economics & Coordinator Center for Development
11.50am– 11.55am	A few words by Pro VC	Prof. Amitava Mitra, Pro VC, Rajiv Gandhi University
11.55 am- 12.00pm	Brief Introduction of the Speaker	Prof. Vandana Upadhyay, Head, Department of Economics & Coordinator Center for Development
12.00 Pm-12.40 pm	Lecture by the Speaker	Prof Vinod Kumar Jain Ex-Professor, Jawaharlal Nehru University, New Delhi and former Vice-Chancellor of Doon University and Tezpur University
12.40 pm-12.50 pm	Concluding remarks by the Chairperson	Prof. Saket Kushwaha Vice-Chancellor Rajiv Gandhi University
12.50pm- 12.55 pm	Vote of Thanks	Anup Kumar Das, Assistant Professor, Department of Economics

## 5.0 Outcome of the Program (Main points of the Lecture)

The programme started with the welcome address given by Prof. Vandana Upadhyay, Head, Department of Economics & Coordinator Center for Development Studies. She also introduced the speaker to the audience. Thereafter, Prof. Amitava Mitra, Pro- Vice chancellor of Rajiv Gandhi University delivered his speech. He said that earlier climate change was an issue to be discussed by the scientists; but now people from diverse disciplines are involved in it. Prof. Mitra added that probably an economist or a sociologist could explain the cost of climate change in much simpler words for people to understand.

Prof. Jain started his speech with a discussion on the factors responsible for climate change and global warming; and the consequences which people across the world have faced presently as a result of climate change. He further elaborated about the various initiatives taken at the international level to meet the challenges of climate change such as the different rounds of negotiations of the Intergovernmental Panel on Climate Change (IPCC). Finally, Prof. Jain discussed about the commitments made by India in the 26<sup>th</sup> Conference of Parties held in Paris; i.e.

- India will get its non-fossil energy capacity to 500 gigawatts by 2030.
- India will meet 50% of its energy requirements from renewable energy by 2030.
- India will reduce the total projected carbon emissions by one billion tones till 2030.
- By 2030, India will reduce the carbon intensity of its economy by less than 45 per cent.
- By the year 2070, India will achieve the target of net zero emissions.

He also discussed about the targets undertaken by other countries like China and the USA. According to him the targets set by China are more ambitious than that of India. He added that the intensity of the problem of climate change has brought China and the USA closer to work on this dimension.

After the lecture by Prof. Jain, there was a question answer session. One faculty member raised question regarding the validity of the issue of climate change; as some of the scientists were not ready to accept the concept of global warming or climate change. While answering to that query he added that the existing data on greenhouse gas emission, raising sea level and other such parameters confirmed the problem of climate change. If the problem was not real, countries like India or China would not spent their limited resources in this direction.

Prof. Saket Kushwaha, honorable vice chancellor of Rajiv Gandhi University who was the chairperson of the programme also put forward his remarks. He talked about the emission of methane gas in Indian agriculture. The programme concluded with the vote of thanks given by Dr. Anup Kumar Das, Assistant Professor, Department of Economics.

## 6.0 Annexure

### 6.1: Brochure:

	<p>RAJIV GANDHI UNIVERSITY CENTER FOR DEVELOPMENT STUDIES DEPARTMENT OF ECONOMICS Special Lecture Series 2022-23 <b>Lecture 7: Climate Change: Its Social, Political and Economic Dimensions</b></p>	
<p>15<sup>th</sup> September, 2022 Time: 11.30 AM; Venue: Conference Hall</p>		
<p><b>Chief Patron</b> Prof. Saket Kushwaha Vice-Chancellor Rajiv Gandhi University</p>	<p><b>Resource Person</b> Prof Vinod Kumar Jain Ex-Professor, Jawaharlal Nehru University, New Delhi and former Vice-Chancellor of Doon University and Tezpur University</p>	<p><b>Patron</b> Prof. Amitava Mitra Pro Vice-Chancellor Rajiv Gandhi University</p>
<p><b>Organizing Chairman</b> Prof. Vandana Upadhyay Head, Department of Economics Coordinators Center for Development Studies</p>		
<p>Dr. Prasenjit Bujar Baruah Assistant Professor Department of Economics, RGU</p>	<p><b>Organizing Secretaries</b></p>	<p>Dr. Anup Kumar Das Assistant Professor Department of Economics, RGU</p>
<p><b>About the Speaker:</b></p>		
	<p><b>Prof Vinod Kumar Jain:</b> Prof Jain completed M.Sc. from Aligarh Muslim University. He was conferred D. Phil from Sussex University, Brighton UK (1982) for the Thesis: Electrostatic Wave Instabilities in Beam Plasma Systems. Prof. Jain began his teaching career at Sussex University (UK) during 1977 – 1981. Later, he served as a Scientist, Class I (1983-1985) in the Department of Physics, Indian Institute of Technology, New Delhi before embarking his journey as an academician, when he joined School of</p>	

Environmental Sciences, JNU as Associate Professor in 1985. He taught M.Sc. and M. Phil. classes for about 25 years at JNU.

Prof Jain has been actively involved in research activities. A keen researcher in the field of magnetized Plasmas, Beam-Plasma interactions - Linear and Nonlinear effects, Environmental Issues (Energy, Noise and Air Pollution), Prof Jain has published 84 research publications in reputed international and national journals in the fields of Plasma Physics and Environmental Sciences and presented papers in several national and international seminars/Conferences. Theses till now. Prof Jain has been members of many academic & statutory bodies, such as, member on panel of experts of University Grants Commission (UGC), Council of Scientific and Industrial Research (CSIR), Union Public Service Commission (UPSC), Public Service Commission of Himachal Pradesh and Public Service Commission of Uttar Pradesh etc.

## 6.2: Photographs:



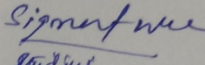
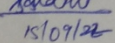
















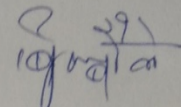
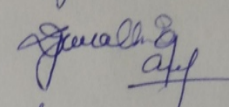
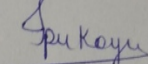
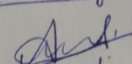
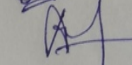
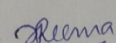
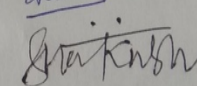
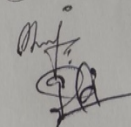

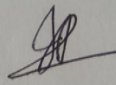
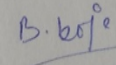
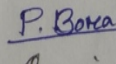
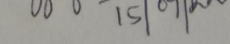
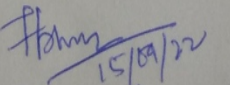
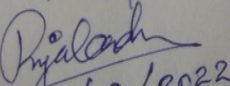
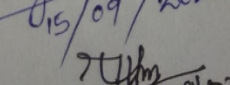
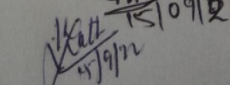
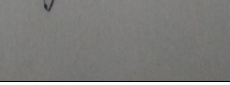


6.3: List of Attendance:

Centre for Development Studies  
Department of Economics  
Rajiv Gandhi University  
Special Lecture Series 2022-23  
Lecture 7- Climate Change: Its Social, Political and economic Dimensions  
15<sup>th</sup> September, 2022  
Time: 11.30am  
Venue: Conference Hall

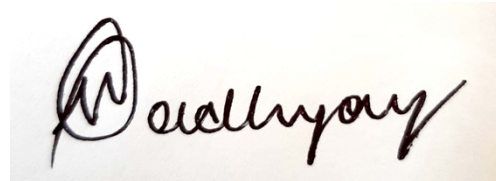
Attendance

Sl No	Name	Department	Signature
1.	Sandhi Sharma	Statistics	
2.	Kantam Monang	Economics	
3.	Kiyang Pawan	Statistics	
4.	Dimpal preston Gogoi	Statistics	
5.	Upasna Saini	Statistics	
6.	Trishna Sikha Neog	Statistics	
7.	OMAN NOPJ	Economics	
8.	MUMTAK BOKO	Economics	M. BOKO
9.	ASHA LEGO	Economics	
10.	TENZIN DREMA	Economics	
11.	Geeta Nath	"	
12.	Bani Jisi	"	
13.	Tenzin Dargy	"	
14.	Junde Maso	"	
15.	Yaje Pechu Parea	"	
16.	Padi Tarung	"	
17.	Jaspi Boje	"	

<u>NAME</u>	<u>ATTENDANCE</u> <u>DEPT.</u>	<u>SIGNATURE</u>
18. Biyuan Bote	Economics	
19. Chinggaon Jifen	Economics	
20. Ipu Koyu	Economics	
21. Tap Yampang	Economics	
22. Karsum Ngomelin	Economics	
23. Habung Reema	Economics	
24. Om Prakash Ram	Economics	
25. Hundi Pulu	Economics	
26. Geling Modi	Economics	
27. Kanchara Deri	Economics	
28. Indrance Penkan	Economics	
29. Bisun Boje	Economics	
30. Pabitra Borah	Economics	
31. Gayatri Gogoi	Economics	
32. Tashi Lamu	Economics	
33. Pija Kachu	Economics	
34. N. Vikimchandra Singh	Statistics	
35. Dr. Krishnajyothi Nath	Statistics	



<u>Name</u>	<u>Attendance</u>	<u>Signature</u>
36. Prof. INDRANIL MUKHOPADHYA	151	<u>Subbath</u>
36. Prof. S. R. Nayak Dept. of Economics		<u>SD</u> 15/9/2022
37. AMITAVA MITRA	do -	<u>SD</u> 15/09/22
38. Ashi° Lama	do	<u>SD</u>
39. Praxmit Bya Bena	do	<u>SD</u>
40. Anup K. Das	"	<u>SD</u>
41. Padma Bahador Chetry	"	Padma Bah. Chetry



Coordinator, Centre for Development Studies  
Department of Economics  
Rajiv Gandhi University



CENTER FOR  
DEVELOPMENT  
STUDIES  
DEPARTMENT OF  
ECONOMICS  
RAJIV GANDHI  
UNIVERSITY



Special Lecture Series 2022-23

Lecture 6: Survey Sampling: Only the Basics



## Survey Sampling: Only the Basics

By

**Prof. Indranil Mukhopadhyay**

**Department of Human Genetics, Indian Statistical Institute,  
Kolkata**

15<sup>th</sup> September, 2022

Time: 2.45 PM Venue: Conference Hall

## Content

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3.1	Theme: Survey Sampling: Only the Basics	6
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## **1.1 About Rajiv Gandhi University**

Rajiv Gandhi University (formerly Arunachal University) is the premier institution for higher education in the state of Arunachal Pradesh. Ever since its inception, the university has been trying to achieve excellence and fulfill the objectives as envisaged in the University Act. The University started functioning from 1st April, 1985. Since then Rajiv Gandhi University then Arunachal University has carved a niche for itself in the educational scenario of the country following its selection as a University with potential for excellence by a high level expert committee of University Grants Commission from among universities in India. The University was converted into a Central University with effect from 9th April 2007 as per notification of Ministry of Human Resource Development, Government of India. The University is located a top Rono Hills on a picturesque tableland of 302 acres overlooking the river Dikrong. It is 25 km away from Itanagar, the State capital.

The teaching and research programmes of the University are designed with a view to play a positive role in the socio-economic and cultural development of the State. The University offers Certificate Courses, Diploma, Post Graduate Diploma, Under Graduate, Post-Graduate and Ph.D. programmes. The Department of Education also offers B.Ed. programme. There are 45 (forty five) colleges affiliated to the University. The University has been extending educational facilities to the students from the neighboring States, particularly Assam. The strength of students in different Departments of University and in affiliated colleges has been steadily increasing. The Faculty members have been actively engaged in research activities with financial support from UGC and other funding agencies. Since its inception, a number of proposals on research projects have been sanctioned by various funding agencies to the University. The various Departments regularly organize Seminars, Workshops and Conferences. Many faculty members participated in national and international conferences and seminars held within the country and abroad. Eminent scholars and distinguished personalities have visited the University and delivered lectures on various disciplines. The academic year 2000-2001 was a year of consolidation for the University. The switch over from annual to semester system took off smoothly and the performance of the students registered a marked improvement. Various syllabi designed by Boards of Post-Graduate Studies (BPGS) have been implemented. In spite of infrastructural constraints, the University has been maintaining its academic excellence. The University has strictly adhered to the academic calendar, conducted the examinations and declared the results in time. The students from the University have found placements not only in State and Central Government Services, but also in various

institutions, industries and organizations. Many students have come out successful in the National Eligibility Test (NET). Since its inception, the University has made significant progress in teaching, research, innovations in curriculum development and developing infrastructure.

### **1.2 About the Department of Economics**

The Department of Economics made its beginning in July 1991. The main objective of the Department has been to impart socially relevant education at the Post Graduate level by judicious mix of theory and empiricism. The course of study and research offering of the department has been designed to meet this objective. The Department of Economics has the distinction of acting as the nodal Department for the preparation of the First Human Development Report (HDR) of Arunachal Pradesh. The Department also has the distinction of preparing the First State Development Report of Arunachal Pradesh. The 7th, 17th and 22nd annual Conference of the North Eastern Economic Association Conference (NEEA) was organised by the Department in 2005, 2015 and 2022 respectively. Recognizing the contributions of the Department, the Ministry of Finance, Government of India in 2012 sanctioned grant-in-aid for establishing the Centre for Development Studies (CDS) attached to the department of Economics.

### **1.3 Centre for Development Studies (CDS)**

The Centre for Development Studies (CDS) was set up in 2013 as a research adjunct at the Department of Economics, Rajiv Gandhi University (RGU), Itanagar, with a generous grant from the Ministry of Finance (Department of Economic Affairs), Government of India. The objectives of the Centre include the creation of high-quality research infrastructure for students, researchers and faculty members, in addition to sponsoring and coordinating research on various developmental issues having policy implications both at the regional and national level. Sponsoring national and international scholars for delivering lectures and other academic engagements and organizing national and international seminars, workshops, symposiums at periodic intervals on relevant topics and publishing working/policy papers on the research outcome of the Centre, monographs and edited volumes are other key activities of the Centre.

### **1.4 CDS Special Lecture Series:**

As a part of its academic activities, the Centre for Development Studies has been organising special Lecture series from time to time with the objective to inform students and researchers regarding the recent development in economics and social science research. Academicians from across the country and abroad are invited to deliver such lectures. Some of the speakers of the previous lectures were Prof. Seema Bathla, Centre for the Study of Regional Development, School of Social Sciences, JNU, New Delhi; Prof. Rajarshi Majumder Department of Economics, University of Burdwan, West Bengal; Dr. Uma Rani, The Research Department, International Labour

Organization (ILO), Geneva; Dr. Ambika Aiyadurai, Department of Humanities and Social Sciences, IIT, Gandhinagar, Gujarat, and Prof. Mrinal Kanti Dutta, Faculty of Humanities and Social Sciences, IIT Guwahati, Guwahati. This present lecture is the seventh lecture of this lecture series.


## 2.0 Organising Committee

<p style="text-align: center;"><b>Chief Patron</b> Prof. Saket Kushwaha Vice-Chancellor Rajiv Gandhi University</p>
<p style="text-align: center;"><b>Patron</b> Prof. Amitava Mitra Pro Vice-Chancellor Rajiv Gandhi University</p>
<p style="text-align: center;"><b>Organizing Chairman</b> Prof. Vandana Upadhyay Head, Department of Economics Coordinators Center for Development Studies</p>
<p style="text-align: center;"><b>Organizing Secretaries</b> Dr. Prasenjit Bujar Baruah Assistant Professor Department of Economics, RGU &amp; Dr. Anup Kumar Das Assistant Professor Department of Economics, RGU</p>

### 3.0 Special Lecture Series 2022-23: Lecture 6

#### 3.1: Themes: Survey Sampling: Only the Basics

#### 3.2: Details of the Resource Persons:

	<p style="text-align: center;"><b>Indranil Mukhopadhyay</b> Professor and former Head, Department of Human Genetics, Indian Statistical Institute, Kolkata</p>
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3.3: **Sponsoring Agency:** Centre for Development Studies, Department of Economics, Rajiv Gandhi University

3.4: **Expenditure Incurred:** Rs.5000/-

#### 4.0 Details Programme:

2.45 pm- 2.50pm	Welcome Address	Prasenjit Bujar Baruah, Assistant Professor, Department of Economics
2.50 pm – 2.55pm	Brief Introduction of the Speaker	Prof. Vandana Upadhyay, Head, Department of Economics & Coordinators Center for Development
2.55 Pm- 3.45 pm	Lecture by the Speaker	Indranil Mukhopadhyay, Professor and former Head, Department of Human Genetics, Indian Statistical Institute, Kolkata
3.45pm- 3.50 pm	Vote of Thanks	Anup Kumar Das, Assistant Professor, Department of Economics

## 5. Outcome of the Program (Main points of the Lecture)

The programme was started with the welcome address given by Dr. Prasenjit Bujar Baruah. After the welcome address, Prof. Indranil Mukhopadhyay delivered his lecture. He started with the question as to why sampling was important. He stated that sampling was important primarily because we do not have information regarding the entire population and it is not possible to have information about the entire population; irrespective of the size of the population. If it was possible to have all information about a population, probably there would be no need to have a statistician or a subject namely Statistics. Then he defined sampling and discussed about the different sampling methods. First, he defined random sampling as well as non-random sampling. Thereafter, he discussed about the different types of random sampling, such as simple random sampling, stratified random sampling, cluster sampling etc.

After the lecture by Prof Mukhopadhyay, there was a interactive session. Prof Mukhopadhyay encouraged the scholars to put forth their queries. There was a question regarding the appropriate sample size; or what should be the sample size, corresponding to a given population. He answered that although there were different formulae to derive the sample size from a given population, it would not be possible for the researcher to have it. For example, suppose someone is interested to do research on breast cancer in Arunachal Pradesh based on primary data. Given the population of Arunachal Pradesh, one formulae may state that the sample size is to be 600. However, it may not be possible or very difficult for the researcher to have that sample size. Even, if he/ she gets the sample of that size, the non-response problem may be there. Finally, Prof Mukhopadhyay stated that **rather than the sample size, the procedure to select the sample is more important**. One of the researchers stated that she was working on urban migrant workers, and there was no information about the size of the urban migrant worker. So, how to decide the appropriate sample size in this case. Answering to this question, Prof Mukhopadhyay stated that although no information was available regarding the size of migrant worker, some alternative method might be adopted. For example, the size of the migrant workers may be assumed to be proportionate to the population size of an urban locality. Thereafter, there was also a discussion on different issues related to sample survey done through email. The programme concluded with a vote of thanks by Prof. Vandana Upadhyay, Head, Department of Economics and Coordinator, Centre for Development Studies.



## 6.0 Annexure

### 6.1: Brochure:



RAJIV GANDHI UNIVERSITY  
CENTER FOR DEVELOPMENT STUDIES  
DEPARTMENT OF ECONOMICS  
Special Lecture Series 2022-23  
**Lecture 6: Survey Sampling: Only the Basics**



15<sup>th</sup> September, 2022  
Time: 2.45 PM Venue: Conference Hall

#### Chief Patron

Prof. Saket Kushwaha  
Vice-Chancellor  
Rajiv Gandhi University

#### Resource Person

**Indranil Mukhopadhyay**  
Professor and former Head,  
Department of Human Genetics,  
Indian Statistical Institute, Kolkata

#### Patron

Prof. Amitava Mitra  
Pro Vice-Chancellor  
Rajiv Gandhi University

#### Organizing Chairman

Prof. Vandana Upadhyay  
Head, Department of Economics  
Coordinators Center for Development Studies

#### Organizing Secretaries

Dr. Prasenjit Bujar Baruah  
Assistant Professor  
Department of Economics, RGU

Dr. Anup Kumar Das  
Assistant Professor  
Department of Economics, RGU

#### About the Speaker:



**INDRANIL MUKHOPADHYAY** is a Professor and former Head of Human Genetics Unit at the Indian Statistical Institute where he has been a faculty member since 2008. Prof. Mukhopadhyay completed his post-graduation and received Ph.D. from University of Calcutta. He pursued his research interests in Time Series Analysis for his doctoral work with Prof. Adhir Kumar Basu. After a stint of teaching in the Statistics Department at St. Xavier's College in Kolkata and University of Burdwan, he went to the USA to study Statistical Genetics and Genomics as a post-doctoral fellow with Prof. Daniel E. Weeks at the Department of Human Genetics, University of Pittsburgh. Indranil has authored more than 50 papers, all published in reputed international journals. His versatility extends to many areas of data science including times series analysis, statistical genomics, single cell data analysis, data integration,

machine learning, statistical inference, public health etc. His work on how to control the spread of COVID-19 and how to determine the number and duration of lockdown hit the news (Times of India) immediately. Prof. Mukhopadhyay visited various international institutes and universities like Harvard University, University of California at Davis, University of Missouri, National University of Singapore, Agro Paris-Tech, INRIA, France, Glasgow University, International Centre for Theoretical Physics at Trieste, Italy etc.

## 6.2: Photographs:







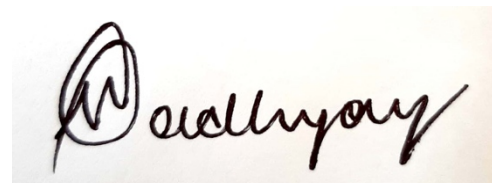
6.3 Attendance List:

Centre for Development Studies  
Department of Economics  
Rajiv Gandhi University  
Special Lecture Series 2022-23  
Lecture 6- Survey Sampling: Only the Basics

15<sup>th</sup> September, 2022  
Time: 2.45pm  
Venue: Conference Hall  
Attendance

Sl No.	Name	Department	Signature
01	TENZIN DARGEY	ECONOMICS	
02	Sanam Takhri	Economics	
03	Junde Naso	Economics	
04	Taxalisa Deori	Economics	
05	Karsum Ngomdir	Economics	
06	Yaje Reali Tolera	Economics	
07	Geeta Nath	"	
08	Shyamali Borahakur	Economics	
09	Bali Jui	"	
10	Upasana Saini	Statistics	
11	Kiyang Paron	"	
12	Sandhu Sonam	Statistics	
13	Karlon mossang	Economics	
14	Zashi Lama	"	
15	Dimpal Protim Gogoi	Statistics	
16	Indraneel Bhattacharya	Economics	
17	Kanchan Dori	Economics	
18	Geling Modi	Economics	
19	Gayatri Gogoi	Economics	
20	Pabitra Borah	Economics	
21	Hupa Kadu	Economics	
22	Havdi pulu	Economics	
23	Asha lego	"	
24	Bijum Bole	or "	
25	Jaori Polley	"	
26	Krishnamayee Nald	Statistics	
27	YANDANA UPADHYAY	Economics	
28	Padma Bahadur chetry	"	
29	Baham Riba	Economics	
30	Kangkim Moyong	"	
31	Kot Aka	"	
32	Rindin Dorjee	"	
33	Ogyanso Talyag	"	

34	Pema Wangdi Khatma	"	Penunjang Khatma.
35	Khadia Apji	"	Khadia
36	Tabem Apum	"	Tabem
37	Pajiv Postim	"	Pajiv
38	Tomé Jinc	"	Tomé
39	Mito Majong	"	Mito
40	Jaja Ipu Kayu	"	Ipu Kayu
41	Dst. Vmed to Tudar	Commune	Estados
42	PRASENIT BUTAR BAROAN	Economia	15-9-22



Coordinator, Centre for Development Studies  
 Department of Economics  
 Rajiv Gandhi University



**THE INDIAN SOCIETY OF LABOUR ECONOMICS**  
**63 LABOUR ECONOMICS CONFERENCE**  
1-3 March 2023 Rajiv Gandhi University, Rono Hills, Itanagar, Arunachal Pradesh, India



## **Conference Report**

### **The Three Day 63<sup>rd</sup> Indian Society of Labour Economics International Conference concludes in Rajiv Gandhi University, Itanagar**

The 63<sup>rd</sup> Annual Conference of the Indian Society of Labour Economics was held in Rajiv Gandhi University (RGU), Itanagar, Arunachal Pradesh during 1-3 March 2023. This Conference was jointly **organised** by the **Centre for Development Studies (CDS) and Department of Economics** of Rajiv Gandhi University, Itanagar, Arunachal Pradesh. Professor Vandana Upadhyay, coordinator of the CDS and Professor of Economics at RGU was the Conference Organising Secretary.

The Inaugural ceremony of the three-day 63<sup>rd</sup> Annual Conference of the Indian Society of Labour Economics was held at Rajiv Gandhi University, Itanagar, Arunachal Pradesh on 1 March 2023. During the inaugural programme Hon'ble **Chief Minister of Arunachal Pradesh Shri Pema Khandu** in his message congratulated the Rajiv Gandhi University for conducting the international conference on a very important issue that concerns the government policy. **Er. Taba Tedir, Hon'ble Minister of Education of Arunachal Pradesh** in his address as the Chief Guest of the Inaugural function expressed his satisfaction at the way the lone Central University of the state, Rajiv Gandhi University has been making remarkable contribution for the academic progress of the state while sending out important direction for the entire student community to bring the light of true development for the benefit of the people through research

and spirit of dedicated service. The **guest of honour Professor Ramesh Chand, Member, Niti Aayog**, praised the ISLE for vibrantly holding conferences and sensitizing societies to contribute towards wealth generation while availing of the benefits of several people-friendly government policies and schemes. The other dignitaries on the dias included, **Mr. Satoshi Sasaki, Director (AI), ILO Office for India** who saw in efforts like the present conference the potential to build an able think-tank which in full responsibility of knowledge of the societies and their goals would be able to make MDGs and SDGs achievable. **Prof. Saket Kushwaha, Vice Chancellor , Rajiv Gandhi University** in his address as the head of the host-institution welcomed the august gathering of delegates from the national and international hue and the eminent dignitaries from international and national bodies like ILO and NITI Aayog and expressed his firm hope of how through commitment and vision major goals can be achieved; **Prof. Deepak Nayyar, former Vice Chancellor of University of Delhi, Prof. Jeemol Unni, President ISLE Conference** and **Prof. Alakh Narayan Sharma, Director, Institute for Human Development** in their respective addresses dwelt on the significance and also contribution of the ISLE to the cause of labour and related programmes with intellectual megameets of the present kind by taking the spirit to sensitize stakeholders and promoting analytical research with thrust on youth participation. **Prof. S. K Nayak**, HoD Department of Economics proposed the vote of thanks.

Over the course of three days i.e 1-3 March 2023, about 600 delegates, including a number of distinguished scholars, policy-makers, and professionals from all over India and many from other parts of the world, participated in the Conference and deliberated on the Conference Themes : (a) **The Challenge of Youth Employment**, (b) **Changing Rural Labour Markets and Rural Diversification**, and (c) **Long Term Impact of COVID 19 pandemic on the Economy and the Labour Market** for



suggesting viable solutions to the issues confronting labour and employment.

The three-day long deliberations were spread over in Technical Sessions, Parallel Sessions, Symposium, Round-Table Discussion and Memorial Lecture. **About 260 + papers** were presented during the Conference across the three Conference themes.

**Six panel discussion and two round tables** were held which covered a **broad range of topics** such as the **impact of covid-19 on the labor market in the global south, migration, and the various aspects related to gender focused on livelihoods and employment across themes such as Women Entrepreneurship in MSME's, women's movement, and care work.**

The **Keynote papers** on these themes were presented by three **distinguished speakers** namely **Sher Verick from ILO, Vinoj Abraham from CDS, Trivandrum, and Ashwani Deshpande from Ashoka University.** Sher Verick presented on the challenges of youth employment and stressed upon the importance of countries developing integrated youth employment strategy that address job creations, quality of jobs, and inclusion. Vinoj Abraham presented on the slow emergence of rural non-farm sector and employment in India, focusing on the trends and patterns in employment in the rural economy, and he discussed the shifts and diversification within rural employment. Ashwani Deshpande discussed the impact of covid-19 on the Indian labour market and stressed that the employment challenge for India is bigger than just achieving pre-pandemic levels, and there is an urgent need to boost job creation and rectify pre-pandemic deep rooted inequalities.

**Four Memorial Lectures** were also delivered during the conference. **Abhijit Sen Memorial Lecture: presented by Ramesh Chand, member NITI Aayog** on Changes in Female Labour-force and Employment: Evidence from PLFS Data. **T.S. Papola Memorial Lecture: presented by Rajat Kathuria on Technology and Future of Work.** The V.V. Giri Memorial Lecture: presented by **Martha (Marty) Chen of Harvard University on the Informal Economy in Comparative Perspective: Theory, Reality and Policy.** The **Y.K. Alagh Memorial Lecture:** presented by **Indira Hirway on Work and Workers in India: Moving towards Inclusive and Sustainable Development.**

A Plenary panel focusing on climate change, livelihood, and employment stressed the consequences of our social and economic systems, and the options available to reduce the adverse impacts and increase capacity to respond. Every year a **special panel** is dedicated to the region in which the conference is organized, this year the panel was on “**Creating Decent Livelihoods and Employment Opportunities in the Hill Economies of North-East India**”. Several experts, **Prof. Atul Sarma, Prof. Barbara Harris White, Prof. M.P. Bezbaruah, Prof. Bhagirathi Panda, Prof. Bijoy K Singh and Prof. Deepak K Mishra and Prof. Rajarshi Bedmatta** exclusive to the region discussed this issue. It is hoped that these celebrations connect the various tracks of dialogue and serve as policy inputs for the governments of the region.

The conference concluded with the Valedictory session on 3rd March, 2023, where the registrar of the University **Dr. N.T. Rikam** welcomed all the delegates. It was graced by the hon'ble Deputy Chief minister **Shri Chowna Mein as the Chief Guest, Prof. Kunal Sen** who delivered the Valedictory address, and **Prof. Dhananjay Singh, Member Secretary, ICSSR as a Chair.** Hon'ble Deputy Chief Minister Shri Chowna Mein in his address said that there was an urgent need to focus on the welfare of the

labour class. The DCM urged the participants to deliberate on the various issues related to labour economics and come up with practical solutions that will benefit the labour class in India. Professor Kunal Sen in his valedictory address spoke on 'Informal Employment in the Global South' and highlighted that "Two billion of the world's employed population aged 15 and over work informally, representing 61.2 per cent of global employment. Excluding agriculture, the global level of informal employment falls to 50.5 per cent, but non-agricultural informal employment remains high in three regions (Africa, the Arab States, and Asia and the Pacific)". According to him, Informality was likely to persist in the developing world for some time to come and it was necessary to find ways to help workers in the bottom tier of the labour market, who are in dead end jobs (and where this may persist over generations). The organizing secretary of the conference informed the house that the honourable Vice chancellor of RGU Prof. Saket Kushwaha in this message had expressed his happiness at the successful completion of the conference and hoped that the deliberations would lead to concrete results in future. He thanked all the delegates for attending the conference held in RGU and wished them all the best. Among others, ISLE president Prof Deepak Nayyar, Indian Council of Social Science Chairperson Prof Dhananjay Singh, and United Nations University-WIDER Professor Kunal Sen, Prof. S.K. Nayak, and Prof. Alakh N. Sharma Director Institute for Human Development, New Delhi and Prof. Vandana Upadhyay also spoke on the occasion.

Three papers were awarded the best paper awards presented in the Conference by the Deputy Chief Minister during the Valedictory session.

The **Surjit Singh Fellowship award** was awarded to Paaritosh Nath, Assistant Professor Azim Premji University and Rahul Menon, Associate Professor O.P. Jindal Global University for their paper '*Understanding*

*Changes in Urban Indian Unemployment: An Examination of PLFS Data*. The **Ruddar Dutt Young Labour Economist award** was awarded to Arun Bairwa and Saakshi Jha, both Assistant Professors in Indian Institute of Management, Ranchi for their paper '*Employment Opportunities in Education Sector in India: An Analysis using PLFS Data*'. The **L.K. Deshpande Young Labour Economist award** was given to Sunita Arora, Assistant Professor Azim Premji University, India and Anshu Saluja, Independent Researcher for their paper '*Diversification of Rural Incomes: A village Study in Central India*'.

This Conference was attended by about 600 delegates from all-over India and abroad, including more than 20 international experts from abroad and ILO. The esteemed participants from the International Labour Organisation included **Mr. Satoshi Sasaki**, Director ILO, Country office India, **Sher Verick**, head employment strategies Unit from **ILO Geneva**, **Nicolas Maitre**, **Igor Alain Bosc Puch**, **Imraan Valodia**, **David Campbell Francis**, **Jens August Lerche**, London School of Economics, **Salim Raihan**, from Bangladesh **Gerald Bernard Rodgers**, **Janine Mireille Zeimert-Rodgers** from Geneva, **Barbara Harriss-White**, University of Oxford, **Martha Alter Chen**, Harvard University, **Prabha Kotiswaran**, Harvard University, **Edgard Rodriguez** from Canada. They comprised public personalities, economists, social scientists and field-practitioners interested in labour, development, employment, industrial relations, human resource development and related issues. All the Deans, HoDs, faculty members, research scholars and students from RGU also attended the three-day conference.

The next conference would be held in the Central University of Hyderabad, where the scholars would deliberate on the following themes:

- Platform Economy and Employment
- Employment and Growth for Sustainable Development
- Care Work and the Economy

### About Indian Society of Labour Economics

The Indian Society of Labour Economics, founded in 1958 by late Mr. V.V. Giri (the veteran trade unionist and former President of India) and some other well-known public personalities and academicians, is a leading professional body of economists, other social scientists and practitioners interested in labour, development, employment, industrial relations, human resource development and related issues.







**National Workshop on  
NSSO Data  
Handling and  
Research with  
Big Data Set**



**8<sup>th</sup> to 12<sup>th</sup> May, 2023**

**Venue: Conference Hall, Department of Economics**



**Organised by**

**Centre for Development Studies**

**Department of Economics**

**Rajiv Gandhi University**

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## **1.1 About Rajiv Gandhi University**

Rajiv Gandhi University (formerly Arunachal University) is the premier institution for higher education in the state of Arunachal Pradesh. Ever since its inception, the university has been trying to achieve excellence and fulfill the objectives as envisaged in the University Act. The university started functioning from 1st April, 1985. Since then Rajiv Gandhi University then Arunachal University has carved a niche for itself in the educational scenario of the country following its selection as a university with potential for excellence by a high level expert committee of University Grants Commission from among universities in India. The university was converted into a central university with effect from 9th April 2007 as per notification of Ministry of Human Resource Development, Government of India. The University is located a top Rono Hills on a picturesque tableland of 302 acres overlooking the river Dikrong. It is 25 km away from Itanagar, the State capital.

The teaching and research programmes of the University are designed with a view to play a positive role in the socio-economic and cultural development of the state. The university offers Certificate Courses, Diploma, Post Graduate Diploma, Under Graduate, Post-Graduate and Ph.D. programmes. The department of education also offers B.Ed. programme. There are 45 colleges affiliated to the university. The university has been extending educational facilities to the students from the neighboring states, particularly Assam. The strength of students in different departments of university and in affiliated colleges has been steadily increasing. The faculty members have been actively engaged in research activities with financial support from UGC and other funding agencies. Since its inception, a number of proposals on research projects have been sanctioned by various funding agencies to the university. The various departments regularly organize seminars, workshops and conferences. Many faculty members participated in national and international conferences and seminars held within the country and abroad. Eminent scholars and distinguished personalities have visited the university and delivered lectures on various disciplines. The academic year 2000-2001 was a year of consolidation for the university. The switch over from annual to semester system took off smoothly and the performance of the students registered a marked improvement. Various syllabi designed by Boards of Post-Graduate Studies (BPGS) have been implemented. In spite of infrastructural constraints, the university has been maintaining its academic excellence. The university has strictly adhered to the academic calendar, conducted the examinations and declared the results in time. The students from the university have found

placements not only in state and central government services, but also in various institutions, industries and organizations. Many students have come out successful in the National Eligibility Test (NET). Since its inception, the University has made significant progress in teaching, research, innovations in curriculum development and developing infrastructure.

## **1.2 About the Department of Economics**

The Department of Economics made its beginning in July 1991. The main objective of the Department has been to impart socially relevant education at the Post Graduate level by judicious mix of theory and empiricism. The course of study and research offering of the department has been designed to meet this objective. The Department of Economics has the distinction of acting as the nodal department for the preparation of the First Human Development Report (HDR) of Arunachal Pradesh. The department also has the distinction of preparing the First State Development Report of Arunachal Pradesh. The 7th, 17th and 22nd annual Conference of the North Eastern Economic Association Conference (NEEA) was organised by the Department in 2005, 2015 and 2022 respectively. Recognizing the contributions of the Department, the Ministry of Finance, Government of India in 2012 sanctioned grant-in-aid for establishing the Centre for Development Studies (CDS) attached to the department of Economics.

## **1.3 Centre for Development Studies (CDS)**

The Centre for Development Studies (CDS) was set up in 2013 as a research adjunct at the Department of Economics, Rajiv Gandhi University (RGU), Itanagar, with a generous grant from the Ministry of Finance (Department of Economic Affairs), Government of India. The objectives of the Centre include the creation of high-quality research infrastructure for students, researchers and faculty members, in addition to sponsoring and coordinating research on various developmental issues having policy implications both at the regional and national level. Sponsoring national and international scholars for delivering lectures and other academic engagements and organizing national and international seminars, workshops, symposiums at periodic intervals on relevant topics and publishing working/policy papers on the research outcome of the Centre, monographs and edited volumes are other key activities of the Centre. The Centre so far has **organised 10 workshops** on different subjects such as Time Series Econometrics, Research Methodology and statistical analysis, Statistical Analysis and SPSS, and NSSO Data Handling and Research with Big Data Set. Additionally, this center organised the 63<sup>rd</sup> Annual Conference of **Indian Society of Labour Economics (ISLE)** in March 2023.

As a part of its academic activities, the Centre for Development Studies has been organising special Lecture series from time to time with the objective to inform students and researchers regarding the recent development in economics and social science research. So far, the Centre has organised 9 such lectures.

#### 1.4 About the Present Workshop:

Research with big data set has assumed importance in view of its widespread use in different socio-economic analyses and policy formulations. National Sample Survey Organisation (NSSO) conducts country-wide surveys from time to time on various socio-economic issues and publishes reports. Further, NSSO provides the data sets to the researchers to conduct research on different topics. However, researchers need some specific expertise to in the extraction and handling of NSSO's unit level data set. Hence, with an objective to give a preliminary understanding of NSSO data extraction and handling of large data sets, the Centre for Development Studies (CDS), Department of Economics, Rajiv Gandhi University decided to organize a week long national workshop on “**NSSO Data Handling and Research with Big Data Sets**” from 8<sup>th</sup> to 12<sup>th</sup> May 2023, for the research scholars and faculty members in Economics. The workshop covered NSSO data extraction as well as estimation of different econometric models with NSSO data.

#### 2.0 Organising Committee

<p><b>Chief Patron</b>  <b>Prof. Saket Kushwaha</b>  Vice-Chancellor  Rajiv Gandhi University</p>
<p><b>Patron</b>  <b>Dr. N. T. Rikam</b>  Registrar, Rajiv Gandhi University  <b>Prof. S. K. Nayak</b>  Head, Department of Economics  Rajiv Gandhi University</p>
<p><b>Organizing Chairman</b>  <b>Prof. Vandana Upadhyay</b>  Coordinators Center for Development Studies,  Department of Economics</p>
<p>Organizing Secretaries  <b>Dr. Prasenjit Bujar Baruah</b>  Assistant Professor  Department of Economics, RGU</p>

&  
**Dr. Dil Bahadur Gurung**  
Assistant Professor  
Department of Economics, RGU

## 2.1 Details of the Resource Persons

	<p><b>Prof. M. P. Bezbaruah</b> Department of Economics Gauhati University Guwahati-781014 Email: bezbaruah.mp@gmail.com Phone: 98640-55485</p>
	<p><b>Prof Joydeep Baruah</b> Professor and Director Surya Kumar Bhuyan School of Social Sciences, Krishna Kanta Handique State Open University Khanapara, Guwahati- 781022 Email: joydeep.baruah@gmail.com Phone: 94351-15889</p>
	<p><b>Prof Rajarshi Majumder</b> Department of Economics University of Burdwan Golapbag Burdwan- 713104 Email: meriju@rediffmail.com; rmajumder@eco.buruniv. ac.in Phone: 94346-71565</p>
	<p><b>Smruti Ranjan Sahoo</b> Research Fellow Centre for Development Studies Thiruvananthapuram Email: smrutiranjancds@gmail.com Phone: 95674-58716</p>

2.2: **Sponsoring Agency:** Centre for Development Studies, Department of Economics, Rajiv Gandhi University

2.3: **Expenditure Incurred:** Rs.3,78,701/- (Rupees three lakh seventy-eight thousand seven hundred one only)

### 3.0 Detail Programme:

#### 3.1 Inaugural Programme:

One Week National Workshop on  
**NSSO Data Handling and Research with Big Data Sets**  
Centre for Development Studies, Department of Economics  
Rajiv Gandhi University, (Doimukh) Itanagar-791112 Arunachal Pradesh  
8<sup>th</sup> to 12<sup>th</sup> May 2023

***Invitation***  
Inaugural Programme

Chief Guest: **Prof. Saket Kushwaha**, Vice- Chancellor, Rajiv Gandhi University

Date: **08-05-2023**  
Time: **9.30 am to 10.30 am**  
Venue: **Conference Hall, Department of Economics**

**Programme**

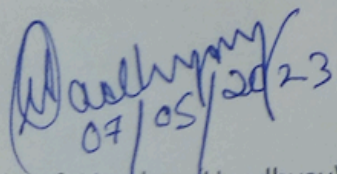
9.30 AM – 9.35 AM	Formation of Dais
9.35AM – 9.40 AM	Welcome Address by <b>Prof. Vandana Upadhyay</b> , Coordinator Centre for Development Studies
9.40 AM – 9.45 AM	Felicitation of the Guests
9.45 AM – 9.50 AM	A few words by <b>Prof. S. K. Nayak</b> , HOD, Department of Economics
9.50 AM – 10.00 AM	Introduction by the Participants
10.00AM – 10.05AM	Brief remarks from the resource person <b>Prof. Joydeep Baruah</b> , KKHSOU, Guwahati
10.05 AM –10.10AM	A few words by <b>Prof. Sarit Kumar Chaudhuri</b> , Dean, Faculty of Social Sciences, Rajiv Gandhi University
10.10AM – 10.15AM	Special remarks by <b>Dr. N. T. Rikam</b> , Registrar, Rajiv Gandhi University
10.15AM – 10.25AM	Address by <b>Prof. Saket Kushwaha</b> , Vice Chancellor, Rajiv Gandhi University
10.25AM - 10.30AM	Vote of Thanks by <b>Dr. D. B. Gurung</b> , Assistant Professor, Department of Economics
10.30 AM	Photo session and Refreshment

### 3.2 Class Routine

Class Routine of the National Workshop on NSSO Data Handling and Research with Big Data Sets

	9.00AM-10.30AM	10.30AM-10.40AM	10.40AM-12.10PM	12.10PM-12.40 PM	12.40PM-2.10M	2.10PM – 2.20 PM	2.20 PM – 3.50 PM	3.50PM-4.00PM	4.00PM- 5.30 PM
05-02-2019 Tuesday	Inauguration	Tea Break	SRS	Lunch Break	JB		JB	Tea Break	SRS
06-02-2019 Wednesday	SRS		SRS		JB	JB	SRS		
07-02-2019 Thursday	SRS		SRS		RM	RM	SRS		
08-02-2019 Friday	MPB		SRS		RM	SRS	SRS		
09-02-2019 Saturday	RM		SRS		SRS	SRS	Valedictory		

MPB: Prof M. P. Bezbaruah  
 JB: Prof Joydeep Baruah  
 RM: Prof Rajarshi Majumder  
 SRS: Dr. Smruti Ranjan Sahoo

  
 07/05/2023

(Prof. Vandana Upadhyay)  
 Coordinator  
 Center for Development Studies  
 Department of Economics

### 3.3: Valedictory Programme:

**One Week National Workshop on  
NSSO Data Handling and Research with Big Data Sets**  
Centre for Development Studies, Department of Economics  
Rajiv Gandhi University, (Doimukh) Itanagar-791112 Arunachal Pradesh  
8<sup>th</sup> to 12<sup>th</sup> May 2023

**Invitation**  
Valedictory Programme

Chief Guest: **Prof. Saket Kushwaha**, Vice- Chancellor, Rajiv Gandhi University

Date: **12-05-2023**

Time: **4.00 PM**

Venue: **Conference Hall, Department of Economics**

#### Programme

4.00 PM – 4.05 PM	Welcome Address <b>Dr. Prasenjit Bujar Baruah</b> , Assistant Professor, Department of Economics
4.05 PM – 4.10 PM	Felicitation of the Guests
4.10 PM – 4.20 PM	A few words from the participants
4.20 PM – 4.25 PM	Remarks by <b>Prof. S. K. <u>Nayak</u></b> , Head, Department of Economics
4.25 PM – 4.30 PM	A few words by <b>Dr. <u>Smruti Ranjan Sahoo</u></b> , Research Fellow, Centre for Development Studies, Thiruvananthapuram and Resource person of the Workshop
4.30 PM – 4.35 PM	A few words by <b>Prof. <u>Rajarshi Majumder</u></b> , Professor, University of Burdwan and Resource person of the Workshop
4.35 PM – 4.40 PM	A few words by <b>Prof. <u>Sarit Kumar Chaudhuri</u></b> , Dean, Faculty of Social Sciences, Rajiv Gandhi University
4.40 PM – 4.45 PM	Special remarks by <b>Dr. N. T. <u>Rikam</u></b> , Registrar, Rajiv Gandhi University
4.45 PM – 4.55 PM	Address by <b>Prof. <u>Saket Kushwaha</u></b> , Vice chancellor, Rajiv Gandhi University
4.55 PM – 5.05 PM	Distribution of participation certificates
5.05 PM – 5.10 PM	Vote of Thanks by <b>Prof. <u>Vandana Upadhyay</u></b> , Coordinator, Centre for Development Studies
5.10 PM	National Anthem
5.15 PM	Lunch

#### 4.0. Outcome of the Program

The programme continued for five days. In the first classes different aspect of STATA was taught. Then in the next classes NSSO data extraction was taught. Prof. Joydeep Baruah taught the topics such as: understanding and working with NSSO unit level data, extracting NSSO unit level data, working with multipliers and generating estimates, and merging and combining data bases.

Mr. Smruti Ranjan Sahoo trained the participants in STATA in the initial classes. There after he trained them in extracting NSSO unit level data. He taught them NSSO data extracting with the data from NSS 67<sup>th</sup> and 73<sup>rd</sup> round surveys on Unincorporated Non-agricultural enterprises. First, he explained the terms and definitions used in the survey and then discussed the data extraction part. Mr. Sahoo also discussed how to estimate different variables from the data set.

Prof. Rajarshi Majumder taught NSSO data extraction with the data set on NSSO employment and unemployment surveys. He took classes on the topic NSSO data extraction and analysis, working with qualitative variables in NSSO surveys, and concepts and estimation of employment/ unemployment status in NSSO surveys.

Prof M. P. Bezbaruah took one session (online) on descriptive statistics. In that class Prof Bezbaruah covered different aspects of descriptive statistics and the appropriate use of such statistics.

Prof Saket Kushwaha, vice chancellor, Rajiv Gandhi University graced both the inaugural and valedictory sessions. In his speech, he explained about the importance of data analysis in research. He added how important it is to have correct research objectives and research questions. Dr. N. T. Rikam, Rajiv Gandhi University and Prof Sarit Kumar Choudhury, Dean, Faculty of Social Sciences, Rajiv Gandhi University also attended both inaugural and valedictory sessions. Prof. Choudhury stated that along with quantitative analysis qualitative analysis is also of importance.

Prof. S. K. Nayak, Head, Department of Economics and Prof. Vandana Upadhyay, Coordinator, Centre for Development Studies Department of Economics also addressed both the inaugural and valedictory sessions.

In the valedictory session, the participants from different parts of India also expressed their experience about the workshop. They said that they were highly benefitted from this workshop and mentioned that such workshops should be regularly conducted.



## 6.0 Annexure

### 6.1: Brochure:



**One Week National Workshop on**  
**‘NSSO Data Handling and Research with Big Data Sets’**  
**Centre for Development Studies, Department of Economics**  
**Rajiv Gandhi University, (Doimukh) Itanagar-791112 Arunachal Pradesh**  
**8<sup>th</sup> to 12<sup>th</sup> May 2023**

**Organising Committees**

**Chief Patron**

**Prof. Saket Kushwaha**  
Vice-Chancellor  
Rajiv Gandhi University

**Patrons**

**Dr. N. T. Rikam**  
Registrar  
Rajiv Gandhi University

**Prof. S. K. Nayak**  
Head, Department of  
Economics  
Rajiv Gandhi University

**Organizing Chairman**

**Prof. Vandana Upadhyay**  
Coordinators Center for  
Development Studies,  
Department of Economics

**Organizing Secretaries**

**Dr. Prasenjit Bujar Baruah**  
Assistant Professor

**Dr. Dil Bahadur Gurung**  
Assistant Professor

Research with big data set has assumed importance in view of its widespread use in different socio-economic analyses and policy formulations. National Sample Survey Organization (NSSO) conducts country-wide surveys from time to time on various socio-economic issues and publishes reports. Further, NSSO provides the Unit Level data which are very useful specifically in socio-economic research. However, researchers need specific expertise in the extraction and handling of such data. Hence, with an objective to give a preliminary understanding of NSSO data extraction and handling of large data sets, the Centre for Development Studies (CDS), Department of Economics, Rajiv Gandhi University is organizing a week-long national workshop on “NSSO Data Handling and Research with Big Data Sets” from 8<sup>th</sup> to 12<sup>th</sup> May 2023, for the research scholars and faculty members (who have not completed their Ph. D) in Economics. The workshop would cover NSSO data extraction as well as estimation of different econometric models with NSSO data.

**How to apply:**  
Interested researcher scholars and faculty members (who have not completed their Ph. D) may apply on or before 2<sup>nd</sup> May 2023 via google link: <https://forms.gle/3n1f8aawKrijdUvHn8>.

**Notes:**

1. Both theoretical and practical classes will be arranged
2. Resource persons would be invited from different Universities/institutes of the country.
3. TA (AC 3 tier train fare by the shortest route) would be provided to the participants.
4. Free food and lodging would be provided to the participants.
5. A total of 25 participants would be selected from different parts of the country.
6. Outstation Participants will have to pay a registration fee of Rs.1000.
7. It is compulsory for the participants to bring their own laptop.
8. Applicants with only Economics background would be considered.

For further queries, interested candidates may email on: [prasenjit.baruah@rgu.ac.in](mailto:prasenjit.baruah@rgu.ac.in)

6.2 Attendance List:

**One Week National Workshop on  
NSSO Data Handling and Research with Big Data Sets**  
Centre for Development Studies, Department of Economics  
Rajiv Gandhi University, (Doimukh) Itanagar-791112 Arunachal Pradesh  
8<sup>th</sup> to 12<sup>th</sup> May 2023

**Registration**

Sl. No.	Name	Designation	Registration Fees	Signature
✓ 1	Khushbu Kumari	Research Scholar, Banaras Hindu University, Varanasi	Rs.1000/-	Khushbu
✓ 2	Deeksha Hazarika	Research Scholar, Dibrugarh University	Rs.1000/-	Deeksha Hazarika 08/05/23
✓ 3	PANCHI HALOI	Research Scholar, Assam University, Silchar	Rs.1000/-	Haloi 8/05/23
✓ 4	MASUMA AHMED	Research Scholar, Dimoria College, Khatra, Dibrugarh University	Rs.1000/-	M Ahmed
✓ 5	JITENDRA KUMAR PAL	Research Scholar, Punjabi university, Patiala	Rs.1000/-	Jitendra Pal
6	A SALAIJAYAMANI	Research Scholar, Sacred Heart College (Autonomous)	Rs.1000/-	A Salaijayamani
7	ISHIKA JAISWAL	Research Scholar, University of Lucknow	Rs.1000/-	Isika
8	BORNITA MONDAL	Research Scholar, Rabindra Bharati University	Rs.1000/-	Bornita Mondal
✓ 9	ANUKRITI NEGI	Research Scholar, Banaras Hindu University, Varanasi	Rs.1000/-	Anukriti
✓ 10	HARJINDER SINGH	Senior Research Fellow, Punjabi University, Patiala	Rs.1000/-	Harjinder Singh
✓ 11	GITANJALI GOSWAMI	Assistant Professor, Barbhag College	-Rs.1000/-	Gitanjali
✓ 12	KANCHAN DEVI	Research Scholar, Rajiv Gandhi University	--	Kanchan Devi
13	HUNDI PULU	Research Scholar, Rajiv Gandhi University	--	Hundi Pulu
14	PUJA KADU	Research Scholar, Rajiv Gandhi University	--	Puja Kadu
15	DAMBARU BHATTARAI	Research Scholar, Rajiv Gandhi University	--	Dambaru Bhattarai
16	<del>ARNOB PAUL</del>	<del>Research Scholar, Rajiv Gandhi University</del>	<del>--</del>	<del>Arnob Paul</del>
17	<del>RITUPORNA DUTTA</del>	<del>Research Scholar, Rajiv Gandhi University</del>	<del>--</del>	<del>Rituporna Dutta</del>
18	GEMIN LEGO	Research Scholar, Rajiv Gandhi University	--	Gemin Lego
19	KONLOM MOSSANG	Research Scholar, Rajiv Gandhi University	--	Konlom Mossang

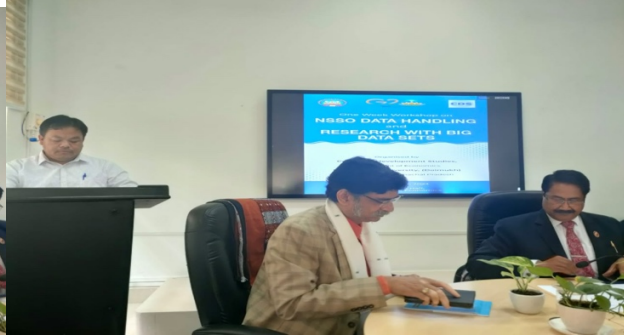
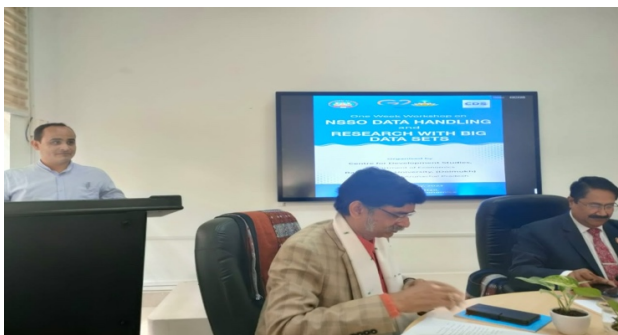
20	SHILPI SHIKHA CHETIA	Research Scholar, Rajiv Gandhi University	--	Shilpi Shikha Chetia
✓ 21	KANCHAN KUMARI SHARMA	Research Scholar, Rajiv Gandhi University	--	KS
22	CHIRANJIB HAZARIKA	Research Scholar, Rajiv Gandhi University	--	Chiranjib
✓ 23	MS. SUPRITY SHYAM	Assistant professor, Rajiv Gandhi University Women's College, Tinsukia	--	Supriya
✓ 24	TASHI LAMU	Assistant Professor, Rajiv Gandhi University Government College, Bomdila	--	Tashi Lamu
✓ 25	GAYATRI GOGOI	Research Scholar, Rajiv Gandhi University	--	Gayatri
✓ 26	PABITRA BORAH	Research Scholar, Rajiv Gandhi University	--	Pabitra
✓ 27	GELING MODI	Research Scholar, Rajiv Gandhi University	--	Geling
28	LIMPI KALITA	Research Scholar, Rajiv Gandhi University	--	Limpi Kalita

6.3: Photographs:











Coordinator, Centre for Development Studies  
Department of Economics  
Rajiv Gandhi University