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Inequality of Opportunity and Sustainable Development: Perspectives from India

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Inequality of Opportunity and Sustainable Development: Perspectives from India[*]

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Abstract

How do we address concerns regarding the environment and sustainability in the context of the discourse of Inequality of Opportunity (IOp)? This paper tries to answer the above question by focusing on India. I argue that environmental considerations can be incorporated as circumstances in the output-effort-circumstance framework of IOp, and discuss the issues raised by doing so. I assess the quantitative importance of the environment for IOp in rural India using data from the Periodic Labor Force Survey (PLFS, 2018-19). I show that environmental circumstances play an important role in influencing outcomes (consumption and earnings) – estimates of IOp are large and compare favorably with those based on other circumstance variables (caste and religion).

Very Preliminary. Please do not cite.

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"In a substantially altered world, when sea-level rise has swallowed the Sundarbans and made cities like Kolkata, New York, and Bangkok uninhabitable, when readers and museumgoers turn to the art and literature of our time, will they not look, first and most urgently, for traces and portents of the altered world of their inheritance? And when they fail to find them, what should they—what can they—do other than to conclude that ours was a time when most forms of art and literature were drawn into the modes of concealment that prevented people from recognizing the realities of their plight? Quite possibly, then, this era, which so congratulates itself on its self-awareness, will come to be known as the time of the Great Derangement."

- Amitav Ghosh (2016)

1. Introduction

The literature on Inequality of Opportunity (IOp hereafter) has been one of the most fertile areas of research in recent times. Drawing upon the fields of economics and philosophy, it has operationalized the distinction between "fair" and "unfair" inequalities and thereby provided a guide for policy.[1] It has made major strides in its goal of providing an alternative to utilitarianism (Roemer and Trannoy 2016). However, an important shortcoming of this literature is its virtual silence on the existential crisis[2] that our planet faces today - related to the *environment* – a term that I use to capture conditions related to the *natural* environment, including ecology and climate.[3] In this paper, I aim to address this important limitation.

I start (in Section 2) by presenting a critical overview of the IOp literature. While some such overviews exist (cited above, in footnote 1), none of them look at the literature from the perspective of the environment. Therefore, the purpose of this review is to show how environmental considerations can be incorporated into the analysis of IOp. The most influential approach in the IOp literature is to divide the characteristics of individuals into effort (which is under the control of individuals) and circumstances (which are beyond the control of

[1] For reviews of this literature, see Ferreira (2019), Osberg (2019), Motiram (2019) and Roemer and Trannoy (2015).
[2] See e.g., Klein (2014), Wallace-Wells (2019) and the various reports of the Intergovernmental Panel on Climate Change: https://www.ipcc.ch.
[3] The writer Amitav Ghosh (see quote above) makes a similar observation about the relative negligence of the ecological crisis in art and literature.

individuals). Individuals are (and deemed to be) held responsible for their circumstances, and the extent of IOp in a society is measured by the degree to which circumstances matter for the outcome of interest. Drawing on this *outcome-effort-circumstances* framework, I show how environmental conditions (as circumstances) play an important role in influencing outcomes. Despite the insights it provides, there are several legitimate critiques of the IOp literature – both philosophical and empirical e.g., the neglect of income from capital (Osberg 2019) and the treatment of luck (Kanbur and Wagstaff 2014). By focusing on the environment, I deepen and add to these critiques. In particular, in the IOp literature, the domain and locus of policy is the nation state or its subnational counterparts (e.g., government departments). I argue that this maybe inadequate once environmental considerations are introduced.

The IOp literature has disproportionately focused on developed countries, although Latin America has seen some studies (see e.g., Ferreira and Gignoux (2011)). This is partly due to the availability of data. But, whatever the reason maybe, this is a situation that needs to be redressed given that a vast proportion of the world's population lives in the global South. I therefore focus on one developing country viz., India. The literature on IOp in India is relatively sparse, but growing. Studies (e.g., Singh 2012; Choudhary et al. 2019; Motiram (2019) presents a survey) have relied on two sources of data: surveys conducted by the National Sample Survey Office (NSSO) and the India Human Development Survey (IHDS) conducted by the University of Maryland and National Council of Applied Economic Research (NCAER). The outcome variables of interest have been consumption, income or education and the circumstance variables that have been found to be important are parental education, parental occupation, gender, caste/religious status and region of residence. Although IHDS has a distinct advantage for the analysis of IOp (better information on parental occupation and education, discussed below), it is

dated now, given that the second round (2011-12) is almost a decade old.[4] More importantly, since the Bharatiya Janata Party (BJP) led National Democratic Alliance (NDA) came to power at the Center (Federal level) in 2014, the Indian economy has seen a slowdown.[5] Given the Hindu-nationalist ideology of the BJP, its policies have also threatened social cohesion and certain groups e.g., Muslims and lower castes (see e.g., Azad et al. (2019)). Recent estimates also suggest that absolute poverty has increased – from 21.9% (269.8 million) to 25.9% (348 million) during the period 2011-12 to 2019-20.[6] IHDS would not be able to capture all these effects. I therefore rely on a more recent household survey: Periodic Labor Force Survey (PLFS), 2018-19.

PLFS contains data on both earnings (income) and consumption and its features are discussed in Section 3, which also presents details of the analysis and findings. I focus on rural areas because residents of rural and urban areas could be (and usually are) subject to different environmental constraints/conditions, whose effects could also be different. Agriculture continues to be an important source of income in rural India and I am particularly interested in agro-ecological conditions and their effects. For outcome variables, I consider both consumption expenditure and income. I use a non-parametric approach (based on decomposition of single-parameter entropy family of indices) to estimate IOp in rural India using the agro-ecological zone of residence as a circumstance variable. I show that this variable explains a sizable share of inequality in both consumption (about 13%) and earnings (about 9.5%). To provide a contrast, I also estimate IOp based on caste and social-group status (caste and religion) – two important sources of inequality in India. The estimates of IOp based on environmental circumstances

[4] Two rounds of the IHDS have been conducted and the first one was in 2004-5.
[5] For growth rates, see Azad et al. (2019). The IMF has recently downgraded India's growth prospects for 2021-22 from 12.5% to 9.5%, see Choudhary (2021).
[6] Figures are from *The India Cable*, August 4, 2021.

compare favorably with those based on caste and social group status. These findings support the case for taking environment seriously in the context of IOp. I discuss this and the policy implications in the concluding section.

2. IOp and the Environment

Several surveys of the IOp literature exist e.g., Roemer and Trannoy (2016) and Osberg (2019). I will draw upon these and Motiram (2018) (which is non-technical) in the discussion below. The key idea in this literature is "responsibility-sensitive egalitarianism" – a desire for equality should take personal responsibility into account. The clearest and most influential formulation of this idea is due to the work of John Roemer and his collaborators (e.g., Roemer 1998; Roemer 2002; Roemer and Trannoy 2016). According to this formulation, certain factors are under the control of the individual, whereas others are not. The former are labelled as "efforts" and the latter as "circumstances". Given that individuals have no control over circumstances, it is unfair to hold them responsible for the consequences of their circumstances. The extent to which circumstances matter can therefore be interpreted as a measure of IOp. This formulation can be seen as a result of several debates in philosophy. Briefly, Rawls (1958; 1971) shifted the focus away from utilities to primary goods and argued that individuals should be held responsible for their life plans. Dworkin (1981a, 1981b) made a case for equality of resources, arguing that it is superior to the idea of equality of welfare. Arneson (1989) and Cohen (1989) move the discourse away from resources and towards opportunities by proposing that egalitarians should aim for "equal opportunity for welfare" and "equal access to advantage", respectively.

In implementing the above outcome-effort-circumstance approach, an outcome of interest is chosen and the relevant effort and circumstance variables are decided based upon the outcome

and context. For example, the outcome of interest could be wage earnings and education could reflect effort. Circumstances could include race, gender, parental occupation or parental education. Both parametric and non-parametric methods can be used to shed light on IOp. In the former, a regression is conducted on the outcome variable (e.g. income) with the effort (e.g., years of education) and circumstances (e.g., age, race, gender, and years of education of father) as explanatory variables. In the latter, the population is conceptualized as being divided into subgroups based upon each circumstance variable (e.g., gender – men and women). Inequality (e.g., as measured by the Theil index) in the outcome variable (e.g., income) is decomposed into a between component (inequality between men and women, for the example of gender) and a within component (a weighted average of the inequality within men and inequality within women).[7] The share of the between component to the total inequality can be interpreted as a measure of IOp due to the particular circumstance variable (i.e., gender). In empirical studies, outcome variables have included wages, income, and consumption expenditure. Education has typically been used to conceptualize effort. Circumstance variables have included education of father, race, gender, ethnicity, and place of residence.

Apart from the abovementioned criticism that the IOp literature has focused disproportionately on the developed world, there are other critiques (e.g., see Kanbur and Wagstaff 2014; Osberg 2019). For example, Osberg (2019) highlights the fact that capital has largely been ignored. Kanbur and Wagstaff (2014) highlight other, more philosopher problems e.g., the failure to distinguish between brute and option luck and the moral problems that arise when the circumstance/effort dichotomy is made with respect to the absolutely poor. I focus on one issue here, which has been underappreciated, and which raises both philosophical and

[7] The population can also be divided based upon effort. For a discussion of this ("tranche") approach and its differences from the "type" approach, see Roemer and Trannoy (2016).

empirical concerns. The IOp literature has essentially ignored the environment. Environmental resources (e.g., water bodies, forests, mountains etc.) and conditions (e.g., air quality, weather patterns, rainfall) are usually beyond the control of a single individual or household. However, these have a bearing on their well-being - economic/material and otherwise. A few examples can clarify this, and I choose these from developing countries, given the focus of the paper. In many developing countries, agriculture relies on favorable weather and the availability of water (including groundwater). The latter depends on decisions made earlier, sometimes by previous generations. These decisions are in turn subject to policies (good or bad). As we increasingly understand now, even weather patterns are influenced by actions and decisions of individuals and governments, sometimes in distant lands (see e.g., Sengupta (2016) on Africa). Another example concerns temperatures. High temperatures have an adverse impact on productivity and our ability to work (Wallace-Wells 2019), which in turn reduces incomes, particularly in activities like agriculture. There is considerable evidence that surface temperature on our planet has been increasing due to human activities.[8] Again, the present generations have to bear the brunt of decisions of previous generations and current and past policies (on fossil fuels, deforestation etc.). A final example concerns air-quality. Pollution and poor air-quality hinder productivity and lead to diseases and even death. According to a recent study (Pandey et al. 2020), air pollution, through its links to health resulted in a loss of 1.36% ($36.8 billion) of India's GDP.

The broad point that I would like to make based on the above observations is that environmental conditions can be treated as circumstances in the output-effort-circumstance framework of IOp. However, this raises several issues that need to be addressed. First is the relation that environmental circumstances have with certain other circumstances. For example,

[8] See the reports of IPCC (http://www.ipcc.ch).

since fetching water for the household is a gendered-task performed mostly by girls and women (Motiram and Osberg 2011), the availability of water has different implications for men versus women (i.e., there is a correlation between water resources and gender). In many developing countries, indigenous people still rely on forests,[9] so deforestation has a disproportionate (and adverse) impact on them. Coastal waters (and schemes that reduce them, like reclamation of land) have a bearing on coastal communities, particularly fishing communities. Second, environmental circumstances can influence effort, and thereby future outcomes. For example, air pollution (poor air quality) has been found to adversely impact cognitive ability of children, which could impair their education and learning. In countries such as India, poor air quality has resulted in school closures (Kausar 2017). Third, the IOp paradigm has been advocated in a context where the outcomes are "measurable" and "narrower" (than utility) and the policy makers work within the domain of the nation state (e.g., government departments).[10] This is well-suited for a situation where environmental circumstances are involved e.g., if the outcome of interest is life expectancy, which in turn depends on environmental factors like air quality, the health and environmental ministries can co-operate to set equity-enhancing policies. However, two caveats need to be added here: (i) problems concerning the environment spill over national borders, so the domain of the nation state may be inadequate in some cases, and (ii) there is a long history of non-state actors (e.g., communities) providing effective solutions to problems

[9] See e.g., FAO (2021) on Latin America and Caribbean.

[10] "… Roemer views the approach as most useful when the outcome in question is something measurable like income, or life expectancy, or wage-earning capacity. He views the usefulness of the approach for policy makers who are concerned with narrower outcomes than overall utility: the health ministry has an objective of life expectancy or infant survival, the education ministry is concerned with the secondary- school graduation rate, the labor ministry is concerned with opportunities for the formation of wage-earning capacity, or for employment, and so on. All these objectives are cardinally measurable, and it makes sense to use any of the operators defined in (3.5) to generate an ordering on policies …" - Roemer and Trannoy (2016).

involving the commons and natural resources, so state and non-state actors can work in conjunction with each other.[11]

Having made a case for incorporating environmental considerations into IOp, I now proceed to the analysis of IOp in India.

3. Data, Analysis and Results

3.1. Description of Data and Methodology

For the analysis of IOp in India, I draw on the PLFS, 2018-19 conducted by the Central Statistical Organization (CSO). The National Sample Survey Office (NSSO, a part of CSO) used to conduct surveys on employment and unemployment situation roughly every five years (quinquennial). The last such survey was conducted in 2011-12, and since 2017-18, these have been replaced by an annual PLFS. Like its predecessors, PLFS is nationally representative and covers all states and regions of India. The technical details of PLFS, including the methodology for sampling and stratification is presented in CSO (2019). One advantage of PLFS over its predecessors is that it contains information on earnings (income) for both regular-wage/salaried and self-employed individuals.[12] Like its predecessors, it contains consumption expenditure for every household. Essentially, PLFS allows us to analyze two outcome variables – income and consumption. PLFS divides the population into four caste groups: Scheduled Tribes (STs), Scheduled Castes (SCs), Other Backward Classes (OBCs) and Others. STs, SCs and OBCs are historically disadvantaged groups in India. STs and SCs are many times combined together – they are named so because they are included in a separate schedule of the Indian constitution, owing to their historically disadvantaged/discriminated status. PLFS also enumerates the religion

[11] See the work of Elinor Ostrom e.g., Ostrom (1990).
[12] Previous surveys contained only wage data.

of every individual. Essentially, PLFS allows us to analyze IOp in India based upon several important circumstance variables including caste, religion and region of residence.

However, the PLFS has two limitations for the analysis of IOp. First, although PLFS classifies rural households into various types (e.g., self-employed in agriculture, casual labor in agriculture), it lacks information on land ownership (or possession) - an important variable in rural areas. Second – and this is the more important limitation – information on parental background, a key circumstance variable, is missing for many individuals. PLFS (like previous surveys of NSSO) gives the occupation and education for each individual and his/her relation to the household head. If (and only if) an individual lives in the same household as his/her parents, one of whom (usually the father) is the household head, then we can get information on parental education and current parental occupation. This restricts the sample of individuals to those living in joint families with their parent(s).[13] Since we cannot control adequately for parental background using PLFS, I use a non-parametric rather than a regression-based approach. As is standard in a non-parametric approach, I use the single-parameter entropy class of subgroup decomposable measures (Mean Log Deviation and Theil index) to measure inequality in the outcome variable (income or consumption). Decomposing this total inequality into between and within components based on each circumstance variable, we can use the contribution of the between component to overall inequality as a measure of IOp due to that particular circumstance.[14]

What do we include under environmental circumstances? How do we divide the rural population into groups with similar environmental circumstances? Since we are interested in IOp

[13] IHDS contains data on the occupation and education of the father of every household head. This is the reason why it has been used more widely in the IOp literature on India.
[14] For details of this decomposition, see Shorrocks and Wan (2005).

in rural areas, where agriculture is an important source of income, several factors need to be considered e.g., rainfall, level of groundwater, soil quality and access to irrigation. The erstwhile planning commission of India[15] had considered the above questions seriously and divided India into fifteen agro-ecological zones. Figure 1 presents the map of India and Table 1 presents these zones and the areas covered by them. As we can observe, large states (e.g., Uttar Pradesh and Madhya Pradesh) are spread over multiple zones – different districts in these states fall under different zones. Using this classification and the geographical identifier of individuals in the PLFS (state and district), I classify individuals into their agro-ecological zones of residence.[16] I use the agro-ecological zone of residence as a circumstance variable. Of course, we have to ask whether the zone of residence is a *choice* – do individuals migrate from one zone to another (more preferred) zone? Such rural-rural migration is a minor phenomenon. According to the latest (2011) Census, internal migrants (migrants within the country) comprise 37% of the population. Of these, a vast majority (88%) migrate within the same state and a large proportion (62%) within the same district (De 2019).

Insert figure 1 and table 1 here

I also consider two other circumstance variables. The first one is caste, and we divide the population into three caste groups: Scheduled groups (ST and SC), OBCs and Others. As we discussed earlier, STs, SCs and OBCs are the historically disadvantaged groups. "Others" is a very heterogenous category that includes so-called forward-caste or upper-caste individuals from multiple religions – Hindus, Muslims, Christians, Sikhs etc.[17] Given this, and the concern

[15] The central (federal) government that came to power in 2014 abolished the planning commission and replaced it with a think tank: National Institute for Transforming India (NITI Aayog).
[16] Since this classification was arrived at, newer districts have been carved out of existing ones. I assign a new district to a zone based on the districts out of which it was created.
[17] Caste is a pan-religious phenomenon in India. Lower and upper castes are present among many religious groups (e.g., Muslims, Christians, Buddhists) – not just among Hindus.

expressed regarding the status of Muslims in India (GOI 2006), I consider a second division, *social group* (combining caste and religion): ST and SC, OBC, Other (Forward-Caste) Hindu, Other (Forward-Caste) Muslim and Others (Forward-Caste Non-Hindu and Non-Muslim).

Analysis and Results

Figure 2 presents average consumption across agro-ecological zones, and we can observe that there is considerable variation. In table 2, I present some important descriptive statistics for consumption expenditure. As we can observe from table 2, there is a clear ranking of caste groups in terms of average consumption - ST/SCs fare the worst and Others (dominated by forward caste Hindus) fare the best. Considering social group, ST/SCs fare the worst and Others (dominated by forward caste Christians) fare the best. However, the performance of Others has to be seen in light of their small share of the population. Other (forward caste) Muslims fare worse than Other (forward caste) Hindus and Others.

Insert table 2 and figure 2 here

In table 3, I present figures for average earnings. Unlike average consumption, which is calculated over all individuals, I calculate average earnings for only male workers aged 15-65 years. These are paid workers i.e., with a positive income and working as self-employed, casual or regular-salaried workers. This excludes groups such as those: attending educational institutions, performing unpaid work (usually in family farms or enterprises), unemployed and retired. The focus on men is due to the fact that a very high proportion of adult women are out of the paid labor force, and therefore have zero earnings. This is of course a reflection of IOp based upon gender. As we can observe, a clear and expected ranking emerges for caste groups – ST/SCs, OBCs and Others in increasing order of average earnings. The ranking of social groups is similar to the one for consumption, although forward caste Muslims fare slightly better than

OBCs. Figure 3 presents average earnings across agro-ecological zones, and (as in the case of consumption), we can observe considerable variation.

Insert table 3 and figure 3 here

In table 4, I present results of a decomposition of consumption expenditure based upon the three circumstance variables discussed above. I focus on all males aged 15-65, given that every individual has a positive consumption. We can observe that agro-ecological factors explain a considerable share (about 13%) of inequality in consumption using both Mean Log Deviation and Theil index. This confirms the hypothesis that environmental circumstances play an important role in shaping consumption and are a vital source of IOp. We can also observe that caste explains about 3% of the inequality in consumption as measured by Mean Log Deviation or Theil index. The corresponding figures for social group are 4.75% and 5.12% for Mean Log Deviation and Theil index, respectively. These figures seem low, but should be interpreted with caution. As pointed by Kanbur (2006), this implies that there is considerable variation within castes and social groups, but inter-caste and inter-social group inequalities should not be deemed unimportant or ignored.

Insert table 4 here

In table 5, I present decomposition results for earnings. Here, I focus on male workers aged 15-65 (i.e., with positive incomes). As in the case of consumption, agro-ecological zone explains a considerable share of inequality – about 9.5% for both Mean Log Deviation and Theil index. The contributions of caste and social group to earnings inequality are similar to the estimates for consumption inequality. For caste, the share of total inequality is about 2 and a quarter percentage for both Mean Log Deviation and Theil index. For social group, the

corresponding figures are 3.06% and 3.29% for Mean Log Deviation and Theil index, respectively.

Do individuals belonging to different age cohorts experience the effects of environmental conditions differently? To answer this question, I divide the sample of male workers into four groups: 15-30 years, 31-40 years, 41-50 years and 51-65 years. These correspond to individuals born in different time periods: 1988-2004, 1978-1988, and so on. In table 6, I present a decomposition analysis of earnings for these cohorts. We can observe that the estimates of IOp do not differ much – by less than 2 percentage points - in the range of 9.39%-11.06% for Mean Log Deviation and 9.88% to 11.58% for Theil index.

Insert table 6 here

4. Discussion and Conclusions

In the above discussion, I have made a case for incorporating environmental considerations into the discourse on IOp – a significant gap in the literature. I have argued that environmental conditions can be incorporated as circumstances in the output-effort-circumstance framework, and discussed the issues that arise from doing so. Applying these ideas to rural India, I have shown that environmental circumstances are an important source of IOp – comparing favorably with estimates of IOp based on caste or social group status.

What are the policy implications of the above analysis? The findings should not be interpreted as making a case for *prioritizing* the environment over other social divisions in India. This is particularly the case since I have relied on a non-parametric estimation that does not control for more than one factor at a time. National-level redistributive policies should aim at correcting regional inequalities based on differences in environmental conditions e.g., better irrigation and groundwater policies in regions that lack in water resources and policies that

protect ecosystems that are fragile. Subnational (state/local level) policies should take the environmental specificities into account while designing policies. Over roughly the past three decades, India has followed a different paradigm - privileging economic growth over other objectives, with a massive cost to the environment (Shrivastava and Kothari 2012). This has also threatened the livelihoods of groups that depend upon forests, coastal waters etc., which has in-turn exacerbated inequalities. Such policies should be reversed or at least arrested.

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Tables and Figures

Table 1: Agro-Climatic Zones in India

Zone	States and Union Territories Covered
1. Western Himalayan region	Himachal Pradesh, Jammu & Kashmir, Ladakh, Uttarakhand
2. Eastern Himalayan region	Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, West Bengal
3. Lower Gangetic plain region	West Bengal
4. Middle Gangetic plain region	Uttar Pradesh, Bihar
5. Upper Gangetic plain region	Uttar Pradesh
6. Trans Gangetic plain region	Chandigarh, Delhi, Haryana, Punjab, Rajasthan
7. Eastern plateau and hills region	Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, West Bengal
8. Central plateau and hills region	Madhya Pradesh, Rajasthan, Uttar Pradesh
9. Western plateau and hills region	Madhya Pradesh, Maharashtra
10. Southern plateau and hills region	Telangana, Karnataka, Tamil Nadu
11. East coast plains and hills region	Andhra Pradesh, Odisha, Puducherry, Tamil Nadu
12. West coast plains and ghat region	Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu
13. Gujarat plains and hills region	Gujarat, Dadra & Nagar Haveli, Daman & Diu
14. Western dry region	Rajasthan
15. Island region	Andaman & Nicobar Islands, Lakshadweep

Source: Planning Commission of India. For details of these zones, see:

Zone 1: https://farmech.gov.in/06035-04-ACZ1-15052006.pdf
Zone 2: https://farmech.gov.in/06035-04-ACZ2-15052006.pdf
Zone 3: https://farmech.dac.gov.in/06035-04-ACZ3-15052006.pdf
Zone 4: https://farmech.gov.in/06035-04-ACZ4-15052006.pdf
Zone 5: https://farmech.gov.in/06035-04-ACZ5-15052006.pdf
Zone 6: https://www.farmech.dac.gov.in/06035-04-ACZ6-15052006.pdf
Zone 7: https://farmech.gov.in/06035-04-ACZ7-15052006.pdf
Zone 8: https://farmech.gov.in/06035-04-ACZ8-15052006.pdf
Zone 9: https://farmech.dac.gov.in/06035-04-ACZ09-15052006.pdf
Zone 10: https://farmech.gov.in/06035-04-ACZ10-15052006.pdf
Zone 11: https://farmech.gov.in/06035-04-ACZ11-15052006.pdf
Zone 12: https://farmech.gov.in/06035-04-ACZ12-15052006.pdf
Zone 13: https://farmech.dac.gov.in/06035-04-ACZ13-15052006.pdf
Zone 14: https://farmech.gov.in/06035-04-ACZ14-15052006.pdf
Zone 15: https://farmech.gov.in/06035-04-ACZ15-15052006.pdf

Table 2: Average Monthly Consumption Expenditure (Rs.)

	Share	Consumption
Caste		
ST/SC	11.63%	5700.335
OBC	65.97%	6716.514
Others	22.39%	7855.021
Total	100%	6853.254
Social Group		
ST/SC	11.63%	5700.335
OBC	65.97%	6716.514
Other (Forward Caste) Hindu	16.60%	7770.579
Other (Forward Caste) Muslim	4.53%	6702.126
Others (Forward Caste Non-Hindu and Non-Muslim)	1.26%	13129.11
Total	100%	6853.254

Source: Author's Computation from PLFS, 2018-19.
Note: Rs. – Indian Rupees.

Table 3: Average Monthly Earnings (Rs.)

	Share	Earnings
Caste		
ST/SC	11.68%	8955.317
OBC	66.01%	10070.03
Others	22.31%	12087.87
Total	100%	10474.02
Social Group		
ST/SC	11.68%	8955.317
OBC	66.01%	10070.03
Other (Forward Caste) Hindu	16.67%	11907.77
Other (Forward Caste) Muslim	4.50%	10996.07
Others (Forward Caste Non-Hindu and Non-Muslim)	1.13%	18418.01
Total	100%	10474.02

Source: Author's Computation from PLFS, 2018-19.
Note: 1. Rs. – Indian Rupees.
2. Sample restricted to male workers (i.e., with positive incomes), aged 15-65 years.

Table 4: Decomposition Analysis of Monthly Consumption Expenditure

	Mean Log Deviation	Theil
Caste		
Within	0.131	0.136
	96.94%	97.04%
Between	0.004	0.004
	3.06%	2.96%
Total	0.136	0.140
Social Group		
Within	0.129	0.133
	95.25%	94.88%
Between	0.006	0.007
	4.75%	5.12%
Total	0.136	0.140
Zone		
Within	0.119	0.122
	87.40%	87.10%
Between	0.017	0.018
	12.60%	12.91%
Total	0.136	0.140

Source: Author's Computation from PLFS, 2018-19.
Note: Sample restricted to males aged 15-65 years.

Table 5: Decomposition Analysis of Monthly Earnings

	Mean Log Deviation	Theil
Caste		
Within	0.198	0.201
	97.76%	97.75%
Between	0.005	0.005
	2.25%	2.24%
Total	0.203	0.206
Social Group		
Within	0.197	0.199
	96.94%	96.71%
Between	0.006	0.007
	3.06%	3.29%
Total	0.203	0.206
Zone		
Within	0.184	0.186
	90.61%	90.41%
Between	0.019	0.020
	9.39%	9.59%
Total	0.203	0.206

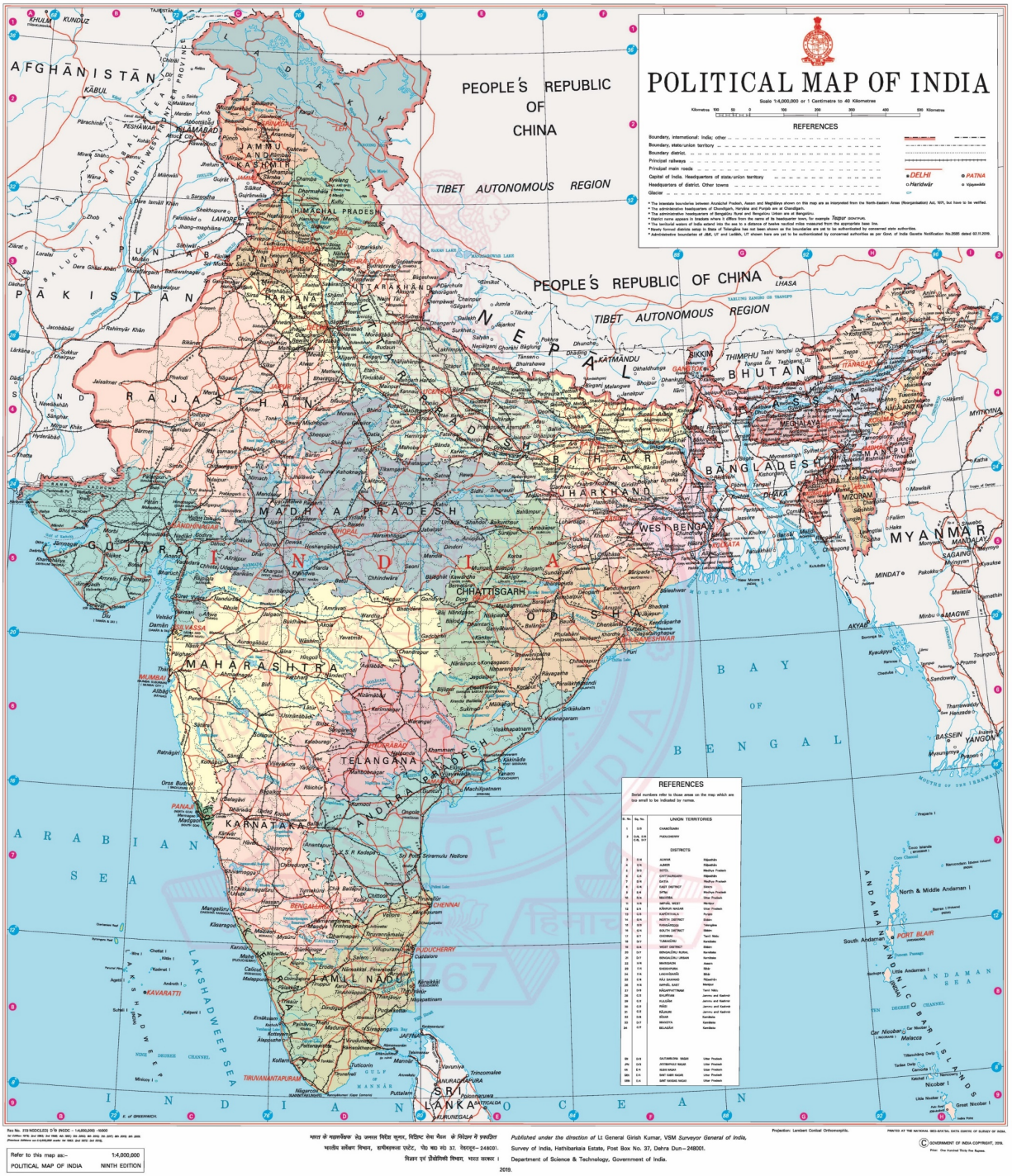
Source: Author's Computation from PLFS, 2018-19.
Note: Sample restricted to male workers (i.e., with positive incomes), aged 15-65 years.

Table 6: Decomposition Analysis of Monthly Earnings for Age Cohorts

	Mean Log Deviation	Theil
15-30 years		
Within	0.145	0.148
	90.01%	89.95%
Between	0.016	0.017
	10.00%	10.05%
Total	0.161	0.165
31-40 years		
Within	0.154	0.155
	89.17%	89.15%
Between	0.019	0.019
	10.83%	10.85%
Total	0.172	0.174
41-50 years		
Within	0.188	0.189
	90.61%	90.11%
Between	0.020	0.021
	9.39%	9.88%
Total	0.208	0.210
51-65 years		
Within	0.235	0.236
	88.94%	88.42%
Between	0.029	0.031
	11.06%	11.58%
Total	0.264	0.267

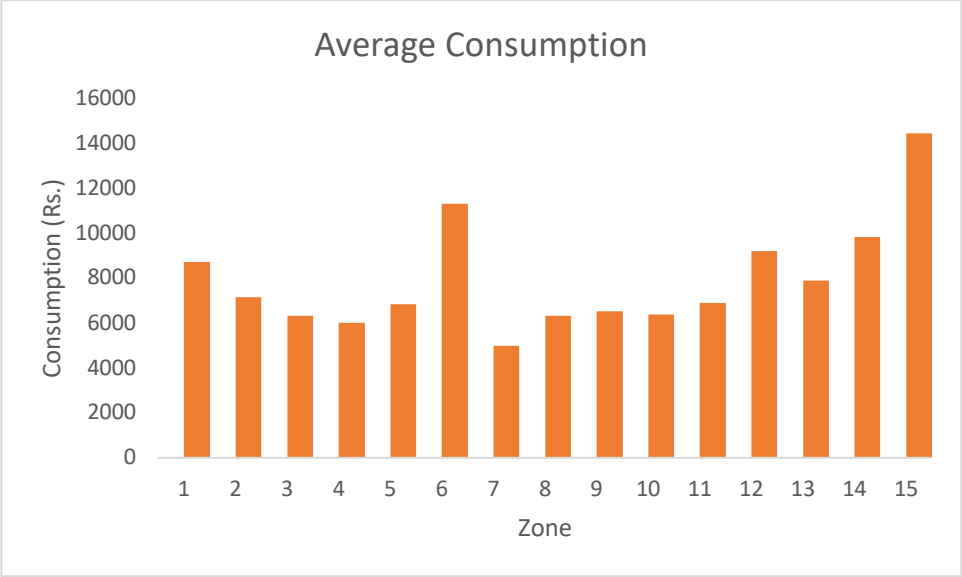
Source: Author's Computation from PLFS, 2018-19.
Note: Sample restricted to male workers (i.e., with positive incomes).

Figure 1: Map of India, Indian States



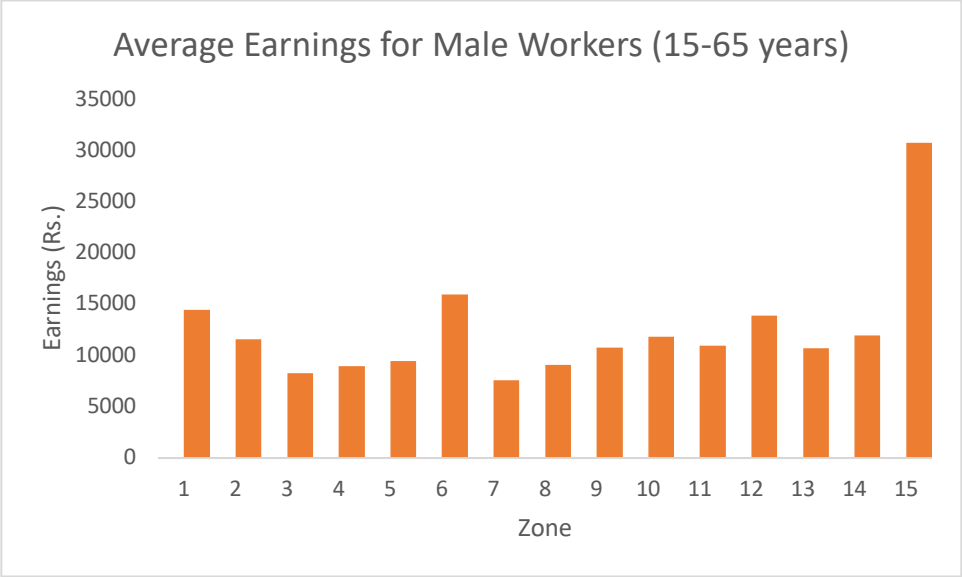
Source: Survey of India, Government of India (http://www.surveyofindia.gov.in/files/Political%20Map%20of%20India.jpg)

Figure 2: Average Monthly Consumption Expenditure (Rs.) Across Zones



Source: Author's Computations from PLFS, 2018-19.
Note: 1. Rs. – Indian Rupee.
2. For the definitions of these zones, see Table 1.

Figure 3: Average Monthly Earnings (Rs.) Across Zones



Source: Author's Computations from PLFS, 2018-19.
Note: 1. Rs. – Indian Rupee.
2. For the definitions of these zones, see Table 1.