Operational Land Holdings in India: Trend and Inequality Analysis (1995 – 2011)

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Abstract

As India is often termed as an agrarian economy and land is the fundamental means of production, therefore, it is of immense importance to study land distribution patterns, for better agricultural planning. A lot of research work has been done to study the after effects of land reforms, inequality in land distribution etc.The paper tries to look at various aspects of (growth in total number and area, inequality in the distribution) individually owned operational land holdings in India for a period spanning from 1995 to 2011. To look at change in individually owned operational land holdings (growth rate in terms of both total number and area under different size class) in India, for the above mentioned period. The paper analyses state wise the change in individually owned operational land holdings (growth rate in terms of both total number and area under different size class) for the above mentioned period, showcases level of inequality in individually owned operational land holdings (in terms of number and area) in India comparing 1995 to 2011, examines level of inequality in individually owned operational land holdings (in terms of number and area) for all states comparing 1995 to 2011.Various statistical, graphical and cartographical (ArcGIS) techniques have been used to analyse the data of Agriculture Census of 1995 and 2011, provided by Ministry of Agriculture, GOI. An attempt has been made to interpret the results precisely and specifically for different regions or states according to their policies, social climate etc. Comparisons between 1995 (20th century) and 2011 (21st century) is what makes the study of immense importance.

Keywords: Operational land holding, individual owner, inequality, gini coefficient, lorenz curve.

Land is the fundamental means of production in an agrarian society without which no agricultural production can take place. An understanding of the pattern of ownership and operational holdings of land is, therefore, of central importance to an understanding of the agrarian class structure.[1]

Operational Holding is defined asall land which is used wholly or partly for agricultural production and is operated as one technical unit by one person alone or with otherswithout regard to the title, legal form, size or location.[2]

An agricultural operational holding is the ultimate unit for taking decision for development of Agriculture at micro level. It is for this reason that an operational holding is taken as the statistical unit of data collection for describing the structure of agriculture.[3]

A person who has the responsibility for the operation of the agricultural holding and who exercises the technical initiative and is responsible for its operation. He may have full economic responsibility or may share it with others. The operational holder may be Individual/Joint/Institutional. For the current study only individual ownership is taken into account, to articulate level of inequality in India.

Individual holder: If the holding is being operated either by one person or by a group of persons who are the members of the same household, such holding will be considered as an

Individual holding.

The study is primarily based upon Agriculture census 2010-11, Ministry of Agriculture, GOI. The Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India. Periodic Agriculture Censuses are important as these are the main source of information on basic characteristics of operational holdings such as land use and cropping patterns, irrigation status, tenancy particulars and the terms of leasing. This information is tabulated by different size classes and social groups including Scheduled Castes / Scheduled Tribes which are needed for development planning, socio-economic policy formulation and establishment of national priorities. The census also provides the basis for the development of a comprehensive integrated national system of agricultural statistics and has links with various components of the national statistical system.[4] Conducts Agriculture Census, quinquennially, to collect data on operational holdings in the country. The reference period for Agriculture Census is the Agricultural year (July-June). Being the ultimate unit for taking agriculture-related decisions, operational holding has been taken as statistical unit at micro-level for data collection.

Review of Literature

H. R. Sharma (1994), has worked on how has the concentration of land, both owned and operated, changed over time? At what level of the landownership hierarchy has land concentration tended to become more pronounced as a consequence of the so-called agrarian reshuffle? How have changes in distribution of landholdings benefited holdings at the bottom?

H. R. Sharma (2007) examines NSSO data on household ownership of land holdings to determine pattern of land distribution and tenancy among different groups.

Vikas Rawal (2008),worked to show inequality in land distribution in rural India by using household level data from the 48th and 59th rounds (1992 and 2003-04) of the NSSO, finds that (within the limitations of the data) more than 40 per cent of households in rural India do not own land, as much as 15 million acres is in ownership holdings of more than 20 acres, and inequality in ownership has worsened between 1992 and 2003-04. He has also questioned the reliability and accuracy of estimates of distribution of ownership holdings and extent of landlessness as shown by NSSO.

Maitreesh Ghatak and Sanchari Roy(2007),Provide literature on the impact of land reform on agricultural productivity in India. They find that, overall for all states; land-reform legislation had a negative and significant effect on agricultural productivity. Showcased state-specific effects, suggesting that focusing on average treatment effects can hide a considerable amount of heterogeneity. In particular, allowing a separate slope for West Bengal, one of the few states that implemented tenancy laws rigorously, they find that land reform had a marginal positive effect relative to the rest of India.

Objectives

The study tries to look at the persisting inequality in the operational land holdings in India in various size classes. Keep on taking into account the trend and growth in the total number and area of these land holdings. The following objectives are tried to be fulfilled:

1. To look at change in individually owned operational land holdings (growth rate in terms of both total number and area under different size class) in India, for the period from 1995 to 2011.

2. To analyse state wise the change in individually owned operational land holdings (growth rate in terms of both total number and area under different size class) for the period from 1995 to 2011.

3. To showcase level of inequality in individually owned operational land holdings (in terms of number and area) in India comparing 1995 to 2011.

4. To showcase level of inequality in individually owned operational land holdings (in terms of number and area) for all states comparing 1995 to 2011.

Methodology: Combinations of various statistical, graphical and cartographical techniques are used to achieve specific objectives, using tabulated data from the Agriculture Census of 1995 and 2011 by the Ministry of Agriculture, Government of India.

➢ To accomplish the first two objectives, Growth rate is calculated using two statistics from the base year 1995 and current year 2011.
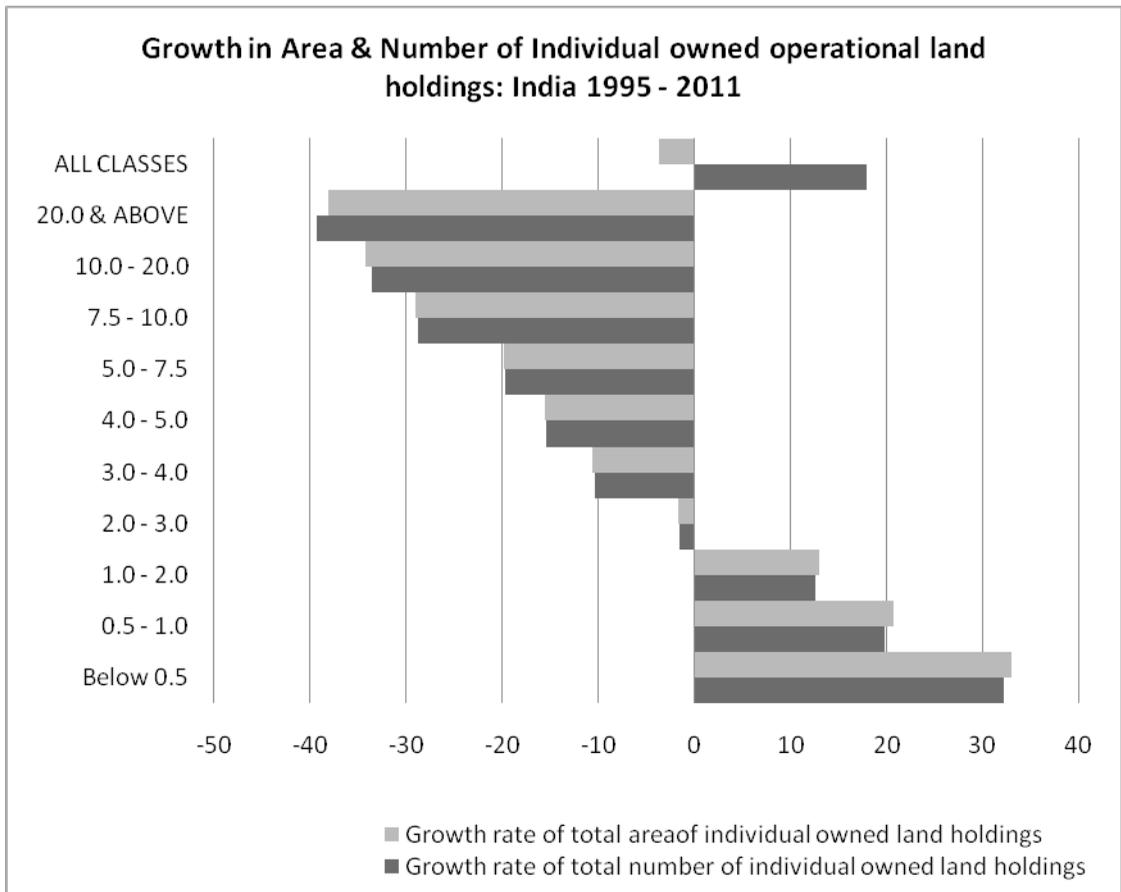
Growth Rate formula: $\dfrac{\text{Current Year} - \text{Base Year}}{\text{Base Year}} \times 100$

➢ To accomplish the third objective Lorenz curve is constructed, whichis a graphical representation of inequality; farther is a Lorenz curve from the diagonal, or the line of equality, greater is the level of inequality. The proportion of area between the diagonal and the Lorenz curve to the total area under the Lorenz curve is a measure of inequality called the Gini coefficient.

➢ To achieve the fourth objective, first the Gini coefficient is calculated using the formula

Gini coefficient formula:$\frac{1}{10000}[\sum X_i Y_{i+1} - \sum Y_i X_{i+1}]$

The value of Gini coefficient ranges from o (perfect equality) to 1 (perfect inequality).

Secondly, the Gini coefficient values were categorised and showcased with the help of an ArcGIS map, showing state wise inequality.
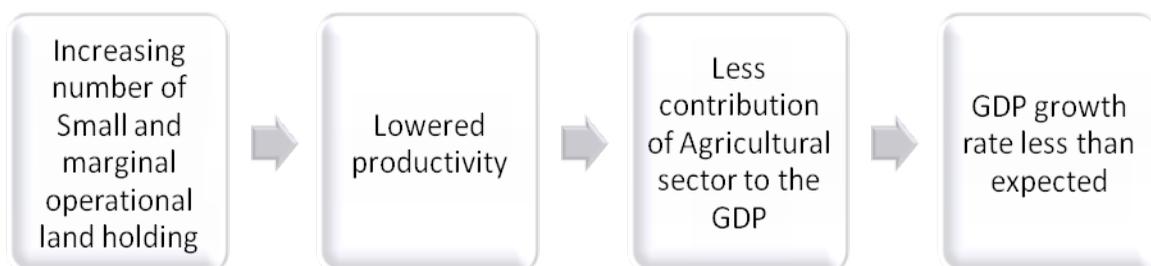

Growth in Area & Number of Individual owned operational land holdings: India 1995 - 2011

■ Growth rate of total areaof individual owned land holdings
■ Growth rate of total number of individual owned land holdings

Change In Individually Owned Operational Land Holdings: India 1995 - 2011

What will take up a lot of discussion in later parts in the study forms its firm ground on the diagram below. Bar-graphs showing change in individually owned operational land holdings in India for the period of 1995 to 2011, actually shows how the land distribution is oriented in the totally wrong direction.

The bars show a positive growth in number and area of marginal and small land holdings, the highest growth in below 0.5 size class. The semi-medium, medium and large classes registered a negative growth in both number and area. This clearly indicates towards the unequal land distribution in India, it might look like a pretty picture that area under small and marginal size class has increased but this is a fraction of what the large sizes still hold, which will be further explained with Gini coefficient values in later part of the study.

If we look at the top bar which shows the growth for All classes, it seems overall in the last fifteen years area under operational land holdings has decreased while their number is increased.This further means small and marginal size farms have increased leading to a slower growth of agricultural productivity. This seems like the root of this whole problem, the increasing number of small and marginal holdings.

Decreased area under agriculture, decrease in large sixe holdings and fragmentation of farmland all of these are to blame for lack of better performance of India's agricultural sector. This is one of the reasons, why GDP is not growing at the expected rate because agricultural sector is not contributing to the GDP, how much it should due to the lowered productivity. The grave process functions like this:

Increasing number of Small and marginal operational land holding ⟹ Lowered productivity ⟹ Less contribution of Agricultural sector to the GDP ⟹ GDP growth rate less than expected

Change In Individually Owned Operational Land Holdings: Statewise 1995 – 2011

The overall change in individually owned operational land holdings, in terms of increase or decrease in total number and area of holdings is being analysed in the bar-graph below. It might throw some light on the effect of land reforms and the practice of sacrificing agricultural land for residential, industrial and other purposes.

There can be three groups of states on the basis of registered growth rate value:

➤ **Both Number and Area negative:** Jammu and Kashmir, Haryana, Punjab, Madhya Pradesh, and Uttar Pradesh. Reasons can be many like,

A shift of economy from primary to secondary and tertiary sector,

Sacrificing agricultural land for urbanisation; to reside the growing population and to walk on the path of industrial development,

People are also giving up agriculture to look for better lifestyle or

May be there are a lot of landless farmers,

➤ **Number negative and Area positive:** no states. This is the ultimate evidence of the ever persisting inequality in land distribution, coz this would have been an ideal scenario that the farm size is getting bigger, which is the best from agricultural productivity point of view and individual holders' point of view. But unfortunately there is no state that could witness this.

Growth in Area & Number of Opearational land holdings (1995 - 2011)
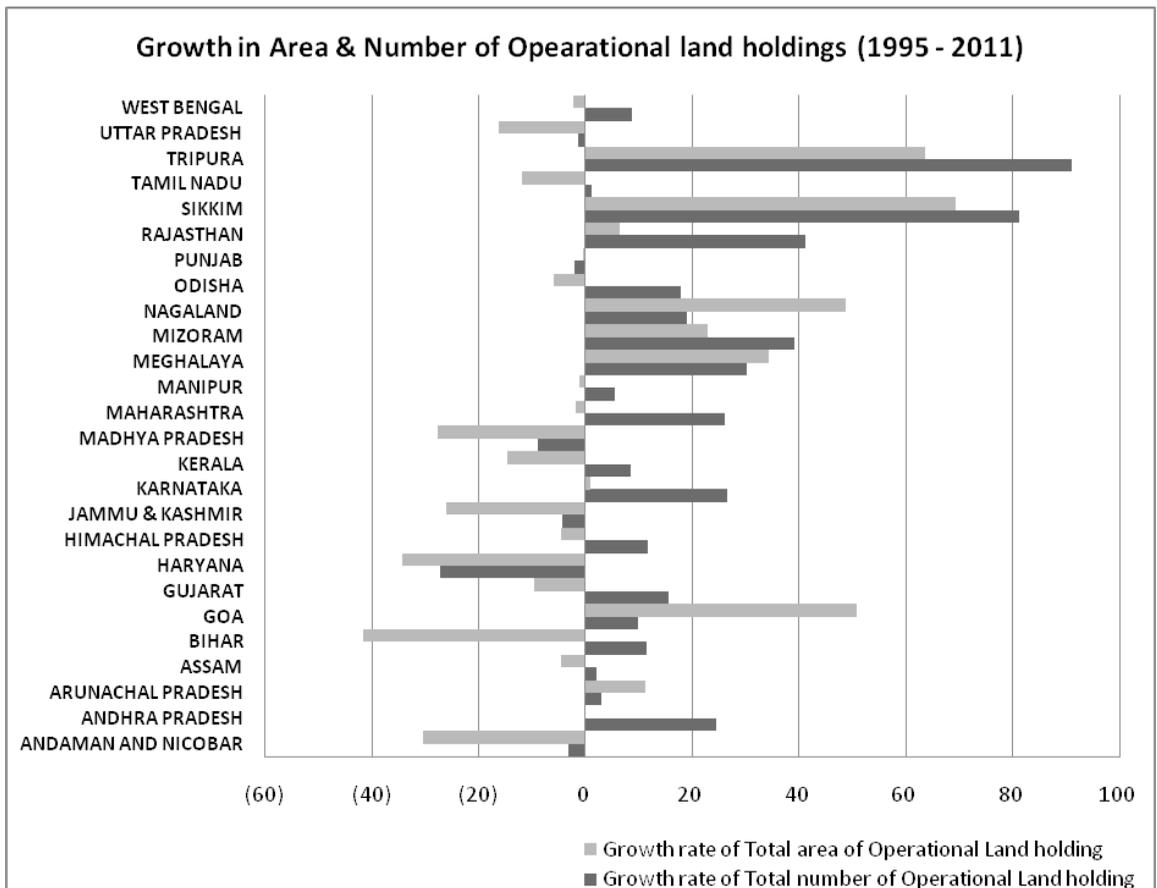
- ➢ **Number positive and Area negative:**Andhra pradesh, Assam, Bihar, Gujarat, Himachal Pradesh, Kerala, Maharashtra, Manipur, Odisha, Tamil nadu, west Bengal. Not so good, as the farm size keeps getting smaller, therefore reducing the agricultural productivity. Fragmentation of farmland is the common practice in Indian society for inheritance but it'salso fragmenting the agricultural economy.

- ➢ **Both Number and Area positive:**Arunachal Pradesh, Goa, Karnataka, Meghalaya, Mizoram, Nagaland, Tripura, Sikkim, Rajasthan. This scenario can not quite assure as to which direction it is going. The north-eastern states are clearing up the forested area and getting it under agricultural use. State like Rajasthan is investing huge amounts in desert area development, Indira Gandhi Nahar Project has also helped a lot of area practice agriculture, drip irrigation, solar power use etc. Have also proved to be of immense potential.

Lorenz Curves of Individual Ownership of Operational Land Holding, India (1995 & 2011)
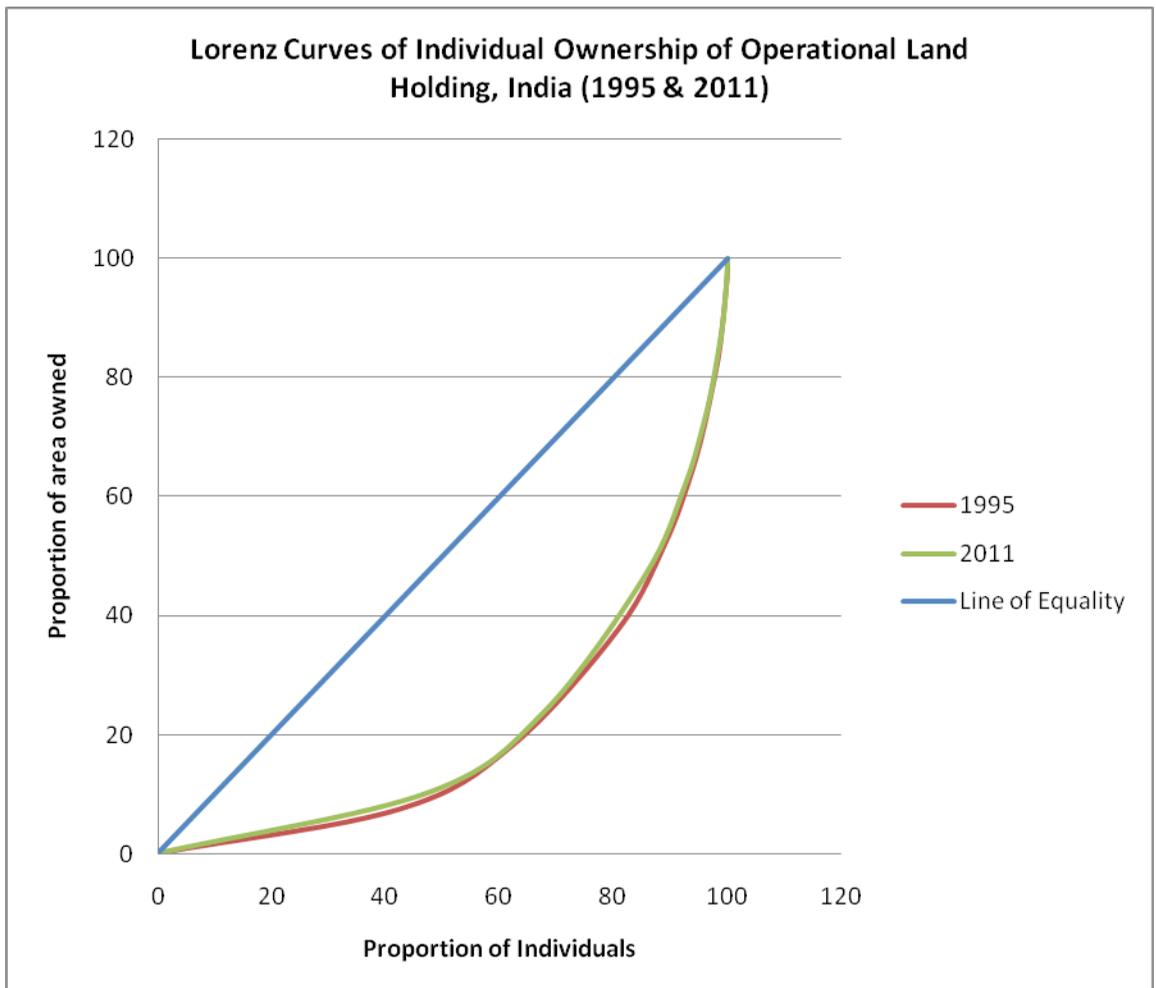
Inequality In Individually Owned Opeartional Land Holdings: India 1995 – 2011

Lorenz curve is a graphical representation of inequality; farther the Lorenz curve is from the diagonal, or the line of equality, greater is the level of inequality. The proportion of area between the diagonal and the Lorenz curve to the total area under the Lorenz curve is a measure of inequality called the Gini coefficient.

The curve below shows inequalities of two time periods 1995 and 2011. Fifteen years is not a short time for inequality to decline significantly, but this however did not happen to India. By looking at the almost overlapping curve lines of both years, it is clearly evident that not much improvement took place in this time period. If looking at the numbers we see, the value of Gini coefficient was 0.588 in 1995 and it decreased to be 0.567 in 2011. The kind of inequality that is persistent in India looks like a dangerous one, and it seems like the governing authorities are not targeting the problems specific to a particular region or a social group.

As the curve lines are indicative of, around 40 percent of individually owned below 0.5 hectare size operational land holdings cover only 7.3 percent of area, 80 percent of holdings cover only 38 percent of area, while 3 percent large size holdings alone cover about 20 percent of the total area. This means that, the distribution of ownership holding of land in India was extremely unequal in 1995 and continues to be unequal in 2011. It also means that land reforms at various times didn't really help in this unequal land distribution.

Table 1. States

States	Growth rate of Total number of Operational Land holding	Growth rate of Total area of Operational Land holding
Andaman and Nicobar	-3.15	-30.18
Andhra Pradesh	24.52	-0.15
Arunachal Pradesh	3.06	11.33
Assam	2.14	-4.36
Bihar	11.47	-41.53
Goa	9.92	50.83
Gujarat	15.66	-9.53
Haryana	-27.19	-34.20
Himachal Pradesh	11.73	-4.36
Jammu and Kashmir	-4.20	-25.95
Karnataka	26.67	1.13
Kerala	8.63	-14.52
Madhya Pradesh	-8.87	-27.53
Maharashtra	26.21	-1.61

Manipur	5.53	-1.02
Meghalaya	30.25	34.49
Mizoram	39.16	22.98
Nagaland	19.17	48.91
Odisha	17.95	-5.88
Punjab	-1.85	-0.24
Rajasthan	41.29	6.58
Sikkim	81.27	69.30
Tamil Nadu	1.17	-11.68
Tripura	91.19	63.73
Uttar Pradesh	-1.25	-16.09
West Bengal	8.74	-2.07

Inequality In Individually Owned Opeartional Land Holdings: Statewise 1995 - 2011

Inequality in individually owned operational land holdings (In terms of Gini coefficient value) state wise is shown with the help of the map below, for the year 1995.

The Gini values range from 0.309 to 0.575, it is often agreed upon that the values more than 0.5 is evidently proving inequality for a region.

The map below has states in dark black and dark grey, which means they have Ginicoefficient values more than 0.5, marking the presence of inequality in individually owned operational land holdings. These states are Rajasthan, Bihar, Karnataka, Sikkim, Goa which had the highest inequality (Gini coefficient more than 0.55) in India in 1995. States like Kerala, Andhra Pradesh, Madhya Pradesh, Haryana and Himachal Pradesh are in the class of second highest inequality (Gini coefficient more than 0.520 but lesser than 0.55)

INEQUALITY IN OPERATIONAL LAND HOLDINGS
INDIA 1995

Gini Coefficient Value
- N. A.
- 0.309 - 0.418
- 0.418 - 0.480
- 0.480 - 0.527
- 0.527 - 0.548
- 0.548 - 0.575

Data Source: Agriculture Census of India, 1995.
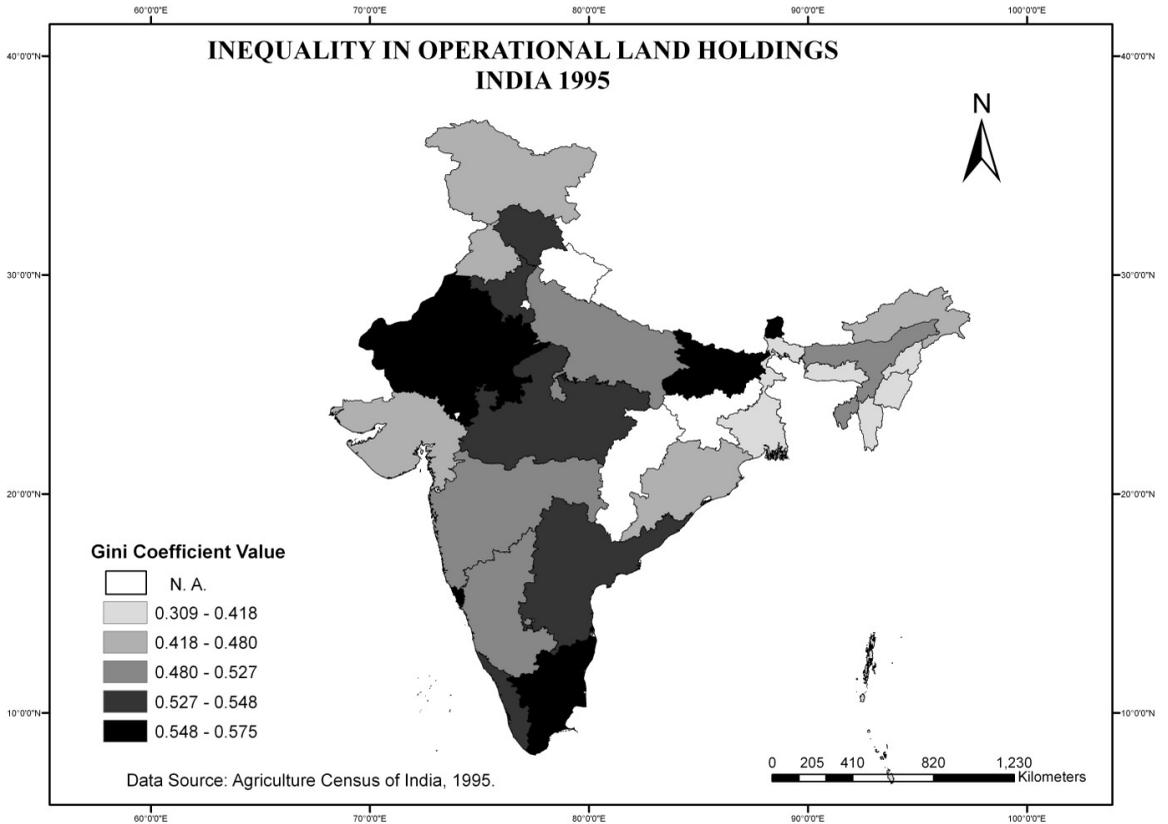
On the other land, West Bengal, Meghalaya, Mizoram, Manipur, Nagaland had the least inequality (Gini coefficient more than 0.309 but lesser than 0.418). the north eastern states a have the egalitarian tribal community responsible for less inequality but it cannot be the only reason, as Himachalpradesh also has tribes but it is higher in disparity. West Bengal had the effect of the left parties' communist ideals.

Inequality in individually owned operational land holdings (In terms of Gini coefficient value) state wise is shown with the help of the map below, for the year 2011. We are here faced with two questions.

1. Whether the disparity decreased in the already disparate states of 1995?

2. Whether there are some new regions emerging with more disparity within, compared to 1995?

3. Whether the three new statescreated in 2001, namely Uttarakhand, Chhattisgarh and Jharkhand, for the purpose of better development, perform as expected, are they less or more disparate than their parent states, did the respective government succeed in securing so-called equal access to resources which was promised to the masses 10 years before?
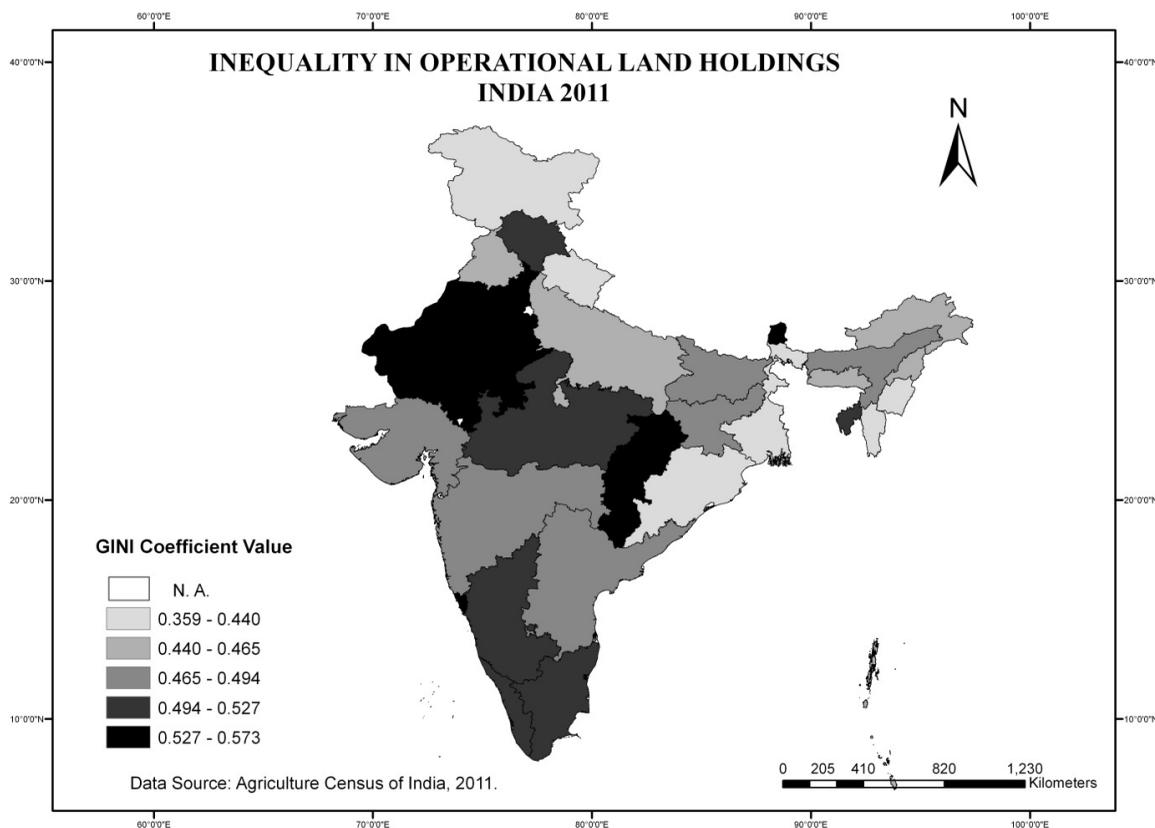
Answering the first question, The above map tells us that inequality in some of the disparate states of 1995 has in fact decreased except for Rajasthan, Sikkim, Goa, Kerala, Andhra pradesh, Haryana, HimachalPradesh. Which means that Karnataka and Bihar have performed better, in reducing the level of inequality, particularly Bihar which now has Gini coefficient value lesser that critical 0.5. Although, Rajasthan (still in the highest value class) Karnataka, Andhra Pradesh, Kerala still have a long way to go.

Himachal Pradesh and Haryana have registered slight decline, but relatively when being looked at with all other states they still seem high enough in inequality.

Answering the second question, the map tells us, Haryana which was in the high inequality class before in 1995, now is in the very high inequality class, while in reality Haryana registered a decrease in Gini value of 0.10 points, but in 2011 classes are redefined and the shrink is not enough to jump one class down. Tripura also jumped one class up to be in the High inequality class. Gujarat registered a slight increase in inequality too.

Table 2. India

SIZE CLASS	Proportion of Number (1995)	Proportion of Area (1995)	Proportion of Number (2011)	Proportion of Area (2011)
Below 0.5	42.20	7.37	47.33	10.18
0.5 - 1.0	62.11	18.06	67.56	23.58
1.0 - 2.0	80.95	37.85	85.57	46.82
2.0 - 3.0	89.22	52.55	92.48	61.82
3.0 - 4.0	93.10	62.38	95.42	70.96
4.0 - 5.0	95.43	70.04	97.10	77.68
5.0 - 7.5	97.94	81.25	98.81	87.00
7.5 - 10.0	98.95	87.60	99.42	91.69
10.0 - 20.0	99.83	96.19	99.91	97.55
20.0 and ABOVE	100.00	100.00	100.00	100.00

Table 3

States	GINI value 1995	GINI value 2011
Andaman And Nicobar	0.379	0.458
Andhra Pradesh	0.530	0.494
Arunachal Pradesh	0.477	0.465
Assam	0.527	0.491
Bihar	0.554	0.484
Chhattisgarh		0.534
Goa	0.576	0.543
Gujarat	0.457	0.474
Haryana	0.538	0.528
Himachal Pradesh	0.543	0.528
Jammu And Kashmir	0.472	0.440
Jharkhand		0.476
Karnatka	0.519	0.499
Kerala	0.538	0.500
Madhya Pradesh	0.549	0.500
Maharashtra	0.488	0.476

Manipur	0.359	0.372
Meghalaya	0.409	0.466
Mizoram	0.310	0.359
Nagaland	0.419	0.448
Orissa	0.462	0.421
Punjab	0.481	0.460
Rajasthan	0.574	0.573
Sikkim	0.557	0.563
Tamilnadu	0.555	0.526
Tripura	0.489	0.511
Uttar Pradesh	0.500	0.454
Uttaranchal		0.437
West Bengal	0.419	0.363

Surprisingly the north-eastern region hasn't performed that well as in 1995.

Table 4

States	Gini value 1995	Gini value 2011
Manipur	0.359	0.372
Meghalaya	0.409	0.466
Mizoram	0.310	0.359
Nagaland	0.419	0.448
Tripura	0.489	0.511

The table above shows the increase in inequality. This is clearly not a good picture and planning authorities need to do something about it.

Answering the third question, the map tells us, that Chhattisgarh has very high Inequality while parent state Madhya Pradesh has high inequality in both 1995 and 2011. It means that Chhattisgarh is not really fulfilling the people's dream of taking control of their own resources, it seems like the separations didn't quite serve them well.

Jharkhand on the other hand is in the same class as Bihar in 2011, doing good and headed for a brighter future. However, Uttarakhand registers lower inequality than parent state of Uttar Pradesh, which is a very positive thing to look at; the state stands in the lowest inequality class.

CONCLUSION

Overall, it is justified to say that there are significant inequalities in distribution of operational land holdings across different size classes. Decrease in agricultural area, decrease in average size of operational land holding, further expected fragmentation of farmland, all of these do not form an ideal picture for agricultural society and economy. Fertile and well productive land taken for purposes other than agriculture is not going to pave the way for development to set in.Social Impact Assessment (SIA) and not cruel Land acquisition bills, Commercial and not subsistence, intensive and not extensive, advanced and not traditional farming is the need of the hour.

(Endnotes)

1   Rawal, Vikas. "Ownership holdings of land in rural India: Putting the record straight." Economic and Political Weekly (2008): 43-47.

2   Agricultural census 2010-11, Ministry of agriculture, Government of India.

3   Agricultural census 2010-11, Ministry of agriculture, Government of India.

4   Agricultural census 2010-11, Ministry of agriculture, Government of India.

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