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Does Returns to Farming Depend on Caste? New Evidence from India

Ashish Singh*

Abstract: This paper analyses the relationship between net farm income per unit of land cultivated and caste divisions in India using a micro unit recorded and nationally representative survey conducted in 2004-05. Findings suggest that the groups that are generally considered disadvantaged (Scheduled Castes/Scheduled Tribes) have, after controlling for other factors, substantially lower farm returns compared to the advantaged (Others) castes, whereas the ‘Other Backward Castes’ occupy position in between. Decomposition of overall net farm income inequality using mean-log deviation indicates that caste based inequality forms a substantial part of it. Results call for policies for neutralizing the impact of caste on agricultural returns in addition to the general policy of land redistribution.

Keywords: Caste, returns to farming, farm income inequality, Caste based inequality, inequality decomposition, India

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Introduction

The existence of poverty and inequality in developing countries has been extensively researched by scholars from ages. While examining economic inequality, they have invariably narrowed down to uneven distribution of land as one its major determinants as far as disparity among rural households is concerned (Griffin 1976; Nadkarni 1980; Ghonemy 1990; Adams and He 1995; Besley and Burgess 1998). The same has been attributed as a reason in case of India also, where there is large disparity in land holdings across different social groups (Deshpande 2001; Thorat 2002; Gaiha et al. 2007; Bakshi 2008). Disparity in agriculture income across different social groups is understandable if there is social disparity in land holdings, but do rural households belonging to different social groups and having similar land holdings (and similar farm practices) receive similar returns in terms of net farm income per unit of land cultivated. If not, then it can be one of the hidden reasons behind the prevailing social inequality in income in the rural areas. If one is familiar with the social structure and the customs associated with it in India, then it is not hard to imagine that there may indeed be disparity in returns to land cultivated across different social groups which are based on caste system.

Indian society has historically been divided into different caste categories. Caste in India has two different concepts- 'Varna' and 'Jati'. The Varna system divided the Hindu (who are in majority) society into four distinct and mutually exclusive categories that are hereditary and occupation specific (Deshpande 2001). They are the Brahmins (priests), Kshatriyas (warriors), Vaisyas (merchants and traders) and Sudras (those engaged in menial jobs). Jatis are also considered castes but their number is very large and they follow a more complex system of hierarchy and rules of conduct. These Jati groups vary spatially and temporally in terms of socioeconomic status, occupations and ritual rankings and align themselves to one of the varnas. The Government of India however has grouped the different jatis into four caste categories based on their socioeconomic status. They are Scheduled Castes (SC), Scheduled Tribes (ST),

Other Backward Castes (OBC) and General (or Other Castes) category. The Hindu stratification system is so deep rooted in Indian society that, though India has been predominantly a Hindu nation, with a substantial degree of religious diversity, a significant percentage of Muslims, Christians, Sikhs etc. also identify and associate themselves with caste groups defined by Hindu traditions (Desai and Kulkarni 2008).

Such a complex social divide compels researchers to enquire about the economic status of different social groups. If rural parts of India are considered, then, even after fifty years of independence it has substantial disparity in land holdings based on caste with households belonging to SC/ST lying at the bottom while those belonging to Others category (hence forth referred as OC) occupying the topmost position (Deshpande 2001; Thorat 2002; Gaiha et al. 2007; Bakshi 2008). When there is disparity in land ownership and farm income being correlated with it, there is bound to be disparity in farm income across different castes. The phenomenon has been investigated upon widely and various laws and regulations in the form of land reforms were enacted to address this issue. Though, the disparity in farm income and land ownership across different castes is a concern in itself and must be dealt with policy interventions, a more fundamental issue which has remained neglected both in qualitative and quantitative work is the question about farm returns. Do, farmers belonging to different caste categories receive similar returns in terms of net farm income per acre of land cultivated? This question is difficult to answer, precisely because it is almost impossible to find a study which has examined the idea of differential returns to farm cultivation based on caste categories.

This study, therefore explores just one basic question, the above mentioned one, which conforms to the concepts of equality and egalitarian justice and is rooted in ethical foundation. If factors like farm size and farming practices are controlled, do rural households belonging to SC/ST categories receive net farm income (per acre of land cultivated) comparable to that of households belonging to OBC and OC categories and do households belonging to OBC

category receive net farm income (per acre of land cultivated) comparable to that of households belonging to OC category. If not, what is the share of caste based inequality in the overall inequality in net farm income per acre of land cultivated in rural India?

There is enough evidence to believe that the returns to farm cultivation may be lower for households belonging to SC/ST than those belonging to OBC, whose returns in turn may be lower than households belonging to OC. The belief comes from the fact that the lower castes have suffered severe exclusion from social activities and public resources, like water wells, public grounds etc. and have been deemed untouchables involving prohibition of interactions including any kind of direct physical contact (Beteille 1969; Mendelsohn and Vicziany 1998; Bayly 1999; Shah et al. 2006). Though the Indian Constitution makes untouchability illegal, it continues to be practiced. Social exclusion as well as atrocities is common in both villages and cities and also translates into active discrimination in access to different governmental and non-governmental services (Banerjee and Knight 1985; Bhattacharjee 1985; Krishnan 1993; Banerjee and Bucci 1994; Lakshmanasamy and Madheswaran 1995; Deshpande 2000; Thorat 2002; Borooah 2005; Thorat and Attewal 2007). In the words of Borooah (2005) ‘at least one-third of the average income differences between SC/ST households and Others households was due to the “unequal treatment” of SC/ST attributes (“discrimination”)’. There is also evidence of substantial caste based disparity in consumption, income, ownership of assets, education, occupation, and development indices (Deshpande 2001; Hasan and Mehta 2006; Mohanty 2006; Mehrotra 2006; Sundaram 2006; Bakshi 2008; Desai and Kulkarni 2008). Three studies worth mentioning here are Kijima (2006), Gang et al. (2007), and Gaiha et al. (2007) which talk about widespread discrimination against the scheduled groups in terms of educational opportunity and occupational choice. They also infer that a major part of the poverty gap between scheduled groups and OC is due to differences in returns to endowments/characteristics. For example, Gang et al. (2007)¹ decomposes the poverty incidence gap between SC, ST and Non SC/ST into

two components: (i) first is the characteristic component that measures the contribution of differences in characteristics or endowments like years of schooling; and (ii) second is referred to as the structural component which takes into account the contribution of differences in the returns to assets (endowments) and other household characteristics including location. They find that about 62.5 per cent of the difference in poverty incidence between SC and non-SC/ST households is due to differences in levels of characteristics (e.g. education and occupation) while 37.5 per cent is due to differences in returns to these characteristics/ endowments. The characteristic effect of occupation contributes about 35.1 per cent to the poverty incidence gap (e.g. less remunerative occupations such as agricultural labor as opposed to self-employment in agriculture). The structural effect (or the difference in returns) is, however, 19 per cent implying that even if the occupations were the same, SC households are rewarded less than the non-SC/ST households. In other words, for example, the agricultural wage rate for SC household members will be lower. Similarly, between the ST and non-SC/ST, 39 per cent of the poverty gap is due to the characteristic effect whereas 61 per cent of the gap is due to the structural differences with difference in returns to occupation being substantial (about 29 per cent). Kijima (2006) reports similar kind of findings.

As there is sufficient evidence of social exclusion and discrimination against the disadvantaged groups in access to public facilities, it is not hard to believe that the returns to farm cultivation will vary across households belonging to different social groups. This paper indeed finds systematic and substantial caste based difference (after controlling for farm size and farm practices) in net farm income per acre of land cultivated among Indian (rural) farmers. The returns to farming is lowest for SC/ST households, followed by OBC households and highest for OC households.

When there are differences in returns to land cultivation across different caste groups, land reforms and land redistribution (which have been the focus of government policy and

research studies since independence) as instruments will fail to achieve the desired objective of increasing equality. Therefore, in addition to land reforms, strategies are needed which can neutralize the impact of caste on agricultural returns, if inter-caste disparity in income in rural areas has to be reduced. But such strategies can only be formulated when existence of effect of caste on farm income can be proved and the extent of the effect can be systematically estimated. With the above objectives, remaining part of the paper has been organized as follows: the next section describes the data set and the methodology; the third section deals with descriptive statistics and results where as the final section focuses on main conclusions along with discussion on policy implications.

Data and Methods

The study is confined to rural parts of India. The data has been taken from Indian Human Development Survey (IHDS), conducted by National Council of Applied Economic Research, New Delhi, India in collaboration with the University of Maryland, in 2004-05. The survey is a micro unit recorded, nationally representative survey based on a stratified, multistage sampling procedure. The survey was spread over all the states and union territories of India except Andaman & Nicobar Islands and covers 26,734 households (143,374 individuals) and 14,820 households (72,380 individuals) in rural and urban areas respectively. The survey contains substantial information on a person's social background including caste, religion, sex, place of birth, education, occupation etc. Besides, the survey also reports the actual earnings for households and individuals from different sources. The survey contains detailed information on land holdings (such as, total land owned, own land cultivated, land rented out, land rented in etc.), income from different farm (income from crops cultivated) and other activities (including livestock, equipments rented out etc.) and expenditure incurred on farm and livestock (including expenses on hired labors, seeds, fertilizers and manures, pesticides and herbicides, irrigation, hiring of equipments, livestock etc.) for every rural household which is very important for this

analysis as it enables to estimate net farm income per acre of land cultivated for every rural household.²

Since the study is based on the net annual farm income per acre of land cultivated, it automatically removes the rural households who didn't cultivate any land in the past year from the analysis. Among the households who cultivated some land, there was an extremely small number who had zero or negative net farm income. Since, zero or negative farm incomes cannot be used for inequality decomposition using mean-log deviation or even Theil's index (the choice of mean-log deviation as a measure for carrying out inequality decomposition has been explained subsequently) they were removed from the analysis. As, there is evidence of productivity (and therefore farm income) being affected by farm size/ land holdings (Mazumdar 1963; Rao 1963; Sen 1964; Mazumdar 1965; Rao 1966; Bhagwati and Chakravarty 1969; Saini 1969; Banerjee 1999; Ghatak and Roy 2007), the households were divided into categories based on total land (in acres) cultivated. The four categories are: households with more than one acre but less than or equal to two acres of cultivated land; households with more than two acres but less than or equal to three acres of cultivated land; households with more than three acres but less than or equal to five acres of cultivated land; and finally households with more than five acres of cultivated land.³ The distribution has been made so as to have a finer control for the effect of land holdings on net farm income as well as to have similar proportion of households in each category.

Since, farm practices and awareness of farmers can also affect productivity (and therefore income), control for these factors have been introduced using the highest educational attainment (which is taken as a proxy for farm practices and general awareness in the household about farming) in the household. It therefore results in each of the four categories based on total land cultivated being further subdivided into four categories based on whether highest educational attainment in the household is zero; more than zero but less than or equal to

primary; more than primary but less than or equal to secondary; and more than secondary.⁴ The division is based on important milestones (uneducated, primary, secondary and above) in progress of individuals in Indian education system as well as to keep proportional balance of households in each subcategory. The aforesaid division, of the households included in the analysis results into a total of sixteen categories which are referred as cohorts (so totally sixteen cohorts) in this study. The details of these cohorts have been provided in Table 1. ‘Table 1 about here’

Analysis has been carried out separately for each of the above mentioned sixteen cohorts. In each of the cohort, the households are further divided into three groups (SC/ST, OBC and OC) based on the caste of household head.⁵ Further details (including distribution of households in and over cohorts) have been provided in the ‘Descriptive Statistics and Results’ section. The net annual farm income per acre of land cultivated has been obtained for each of households in the three groups and includes only the net income from the land cultivated (own land as well as land rented in) and doesn’t include any income or expenditure from livestock, equipments rent out or land rent out. The net farm income per acre of land cultivated is nothing but the returns to farm cultivation. The net farm income per acre of land cultivated, of these groups (each group contains the net farm income of households with same caste category) are then compared with one another. Since all the households in any particular group belong to the same caste category, whereas the household belonging to different groups are from different caste categories the difference in net farm income per acre of land cultivated between the three groups can be safely attributed to caste based inequality (as each group in any cohort have similar land holding and similar awareness about farm practices).

One may argue here that the reason for the difference in net farm income across different caste groups is due to the difference in fertility of land (and not caste effect) belonging to the different groups, but my counter argument is, why fertility of land owned by SC/ST is

poorer than that of OBC which in turn is poorer than OC across whole India (as detailed in next section, the net farm income per acre of land cultivated in each of the sixteen cohorts is systematically lowest for SC/ST households, highest for OC households with OBC households lying in between). Is it the case that historically the land was divided among the OC, OBC and SC/ST in decreasing order of fertility? If that is the case, it is surely the consequence of caste and therefore can be attributed to as effect of caste. Also, in this case, the distribution of land based on fertility can be the cause (which is not being enquired in this study) of the caste based inequality in net farm income (which is the effect and is being enquired).

Researchers can also argue that the difference in net farm income per acre of land cultivated across different caste categories is due to difference in nature of crops (thus denying caste effect), that is, may be households belonging to OC caste category are cultivating high yielding varieties or cash crops where as the households belonging to disadvantaged caste categories are cultivating low yielding varieties or traditional crops. My counter argument to this is as follows: since the analysis has been carried out separately for each cohort and households in each cohort have similar land holdings and highest educational attainment (and therefore similar awareness), why a household will cultivate low yielding or traditional crop when there is information that another household (belonging to another caste but in the same village or adjacent village) with similar landholding is cultivating cash crop/ high yielding crop and earning more. And the argument that throughout rural India, households belonging to OC category systematically cultivate high yielding or cash crops where as their counterparts belonging to disadvantaged castes, though, with similar land holding and awareness systematically cultivate low yielding or traditional crops is impossible to accept.⁶ Further, if one sees the inequality in net farm income per acre of land cultivated between the caste groups in light of the discussion on social exclusion as well as the discrimination suffered by the

disadvantaged castes, it will not be difficult for him/her to attribute the between group inequality in each cohort to the effect of caste.

An additional issue which can be raised about the pan-India nature of study itself is, whether the study can be conducted for the whole India or not. The common argument against the pan-India nature is one acre of dry land is different from one acre of wet land which is indeed true. But the argument in favor of the study is that one acre of dry land for an SC/ST household in a region shouldn't be different from one acre of dry land for an OC household in the same region. Similar should be the case with wet lands. Therefore, aggregation at all India level is not likely to affect the nature of analysis.

Since, in every cohort the inequality between the different caste groups can now be attributed safely to caste based inequality, it is important to discuss the inequality decomposition exercise carried out in this paper. For every cohort, the decomposition of net farm income per acre of land cultivated, into within-group and between-group (the groups based on caste categories) has been carried out separately using mean-log deviation. The exact decomposition procedure is as follows:

Let the index (mean log deviation) be represented by M , and suppose that the set of households (in any cohort), N , is partitioned into m proper subgroups N_k ($k = 1, 2, \dots, m$), with respective income vectors y^k , mean incomes μ_k , population (households) sizes n_k , and population (households) shares $v_k = \frac{n_k}{n}$. Also, let \bar{y}^k denote the distribution obtained by replacing each income in the vector y^k with the subgroup mean, μ_k . Then,

$$M(y) = M(y^1, y^2, \dots, y^m) = \frac{1}{n} \sum_{k=1}^m \sum_{i \in N_k} \ln \frac{\mu_k}{y_i}$$

$$\begin{aligned}
&= \sum_{k=1}^m \frac{n_k}{n} \frac{1}{n_k} \sum_{i \in N_k} \ln \frac{\mu_k}{y_i} + \frac{1}{n} \sum_{k=1}^m \sum_{i \in N_k} \ln \frac{\mu}{\mu_k} \\
&= \sum_{k=1}^m v_k M(y^k) + \sum_{k=1}^m v_k \ln \frac{\mu}{\mu_k} \\
&= W + B \tag{1}
\end{aligned}$$

where W is the within group inequality and B represents the between group component. For example, if first cohort is considered (households with a total cultivated land of more than one acre but less than or equal to two acres and highest educational attainment in the household being zero years), the three subgroups in this cohort (as in other cohorts also) are households belonging to SC/ST, OBC and OC categories respectively. If the inequality in net annual farm income per acre cultivation (per household) is now decomposed using mean-log deviation, it will yield two components; the first component will be the weighted average of within-group inequality values (commonly referred as within-group component, W) the weights being the proportions of households in each subgroup (e.g., weights here will be proportion of SC/ST households in total; proportion of OBC households in total; and proportion of OC households in total, for the first cohort). The second component is the between-group component, representing the level of inequality obtained by replacing the net farm income per acre of land cultivated of each household with the mean net farm income per acre of land cultivated of their respective subgroup. The second component is nothing but the between-caste component or the caste based inequality, B . Thus, for the mean-log deviation, the overall level of inequality for each cohort can be expressed in an intuitively appealing fashion as an exact sum of the average inequality within castes and the inequality due purely to differences in average net farm income per acre of land cultivated between castes. The ratio of between-group component to the overall inequality will give the caste based inequality as a proportion of the overall inequality. This

process can be and has been repeated for all the sixteen cohorts to obtain the share of caste in the overall inequality in per acre net annual farm income in each cohort.

The choice of mean-log deviation as the inequality measure for decomposing overall inequality in net farm income per acre of land cultivated into within-group inequality and between-group inequality was rather limited. The limitation comes from the properties which need to be satisfied in order to carry out the required decomposition. The inequality measures commonly used by authors in empirical work include the following: (a) the relative mean deviation; (b) the variance; (c) the coefficient of variation; (d) the Gini coefficient and (e) Generalized single parameter class of entropy measures, commonly known as GE measures which include the mean log deviation (GE(0)), the Theils's index (GE(1)) and the half coefficient of variation squared (GE(2)). The measure for the present study was chosen in such a way that it satisfies six axioms or properties which comprise of the four standard axioms of (i) anonymity or symmetry; (ii) population replication or replication invariance; (iii) mean independence or scale invariance; (iv) Pigou-Dalton principle of transfers and the additional axioms of (v) additive subgroup decomposability and (vi) path independence.⁷ The additional properties of additive subgroup decomposability and path independence are particularly important for the present study. The additive subgroup decomposability is important because the study primarily decomposes the overall net per acre farm income inequality into within-group and between-group components. Since the interest is in between-group component (caste based inequality), the property of path independence is also required, in the sense that the decomposition must yield the same result or the decomposition is invariant to whether within group inequality is eliminated first and the between group component computed second, or the reverse (Ferreira and Gignoux 2008). The only measure (Shorrocks 1980; Foster and Shneyerov 2000; Shorrocks and Wan 2005) which satisfies all the above six properties is the mean-log deviation, GE(0), belonging to the generalized single parameter class of entropy measures.

All the other members (including the Theil's index) of the generalized entropy class satisfy the first five of the above axioms but fail to satisfy the path independence property therefore making them less desirable for the present study. The Gini index which is one of the most commonly used inequality measure also satisfies the first four axioms but is not additively decomposable in the same way as the mean log deviation (Bourguignon and Ferreira 1979; Shorrocks 1980; Shorrocks and Wan 2005). Some authors have attempted to decompose the Gini index in specific contexts (Lambert and Aronson 1993). The closest decomposition (of the Gini index) similar to the additive subgroup decomposability property of the generalized entropy class measures yields three components, within-group component, between-group component and a residual or interaction effect. The residual effect vanishes only when the range of the incomes of the subgroups do not overlap (which is clearly not the case in this study) and is otherwise strictly positive (Shorrocks and Wan 2005). When the residual term (or the interaction term) is not zero then the between-group effect cannot be obtained clearly from the decomposition.

If any member (other than mean log deviation) of the generalized entropy class which doesn't satisfy the property of path independence (for example Theil's index) is used then the results may change but the change will be rather small.⁸ The use of mean log deviation is further reinforced from its use in the studies like Checchi and Peragine (2009) and Singh (2010) which have decomposed the overall wage earnings inequality into two components, one due to efforts (within-group component) and the other due to external circumstances captured by parental education (between-group component) for Italy and India respectively. The groups were formed on the basis of circumstances, which was captured by parental education. These studies are similar to ours in principle, as they have tried to find out the part of inequality in wage earnings which is due to differences in parental education which is a circumstance variable exogenous to an individual similar to caste in our case.

To sum up the framework used in this paper, for every cohort (based on land cultivated and highest educational attainment in the household) the sample was partitioned into three groups based on the caste of the household head. Since the households belonging to different groups belong to different caste categories, therefore the disparity in per acre net farm income of households belonging to different groups has been attributed to caste. Also, for every cohort, mean log deviation was used to decompose the overall per acre farm income inequality into the within-group component and the between-group component which is nothing but the caste based inequality.

Descriptive Statistics and Results

The study has started with the expectation of lower farm returns for the households belonging to disadvantaged caste categories compared to those belonging to advantaged (OC) category. The descriptive statistics in Table 2 indeed support this expectation. ‘Table 2 about here’

It can be observed from table 2 that the net annual farm income per acre of land cultivated for OC households is systematically more than OBC households and the net annual farm income per acre of land cultivated for OBC households is systematically higher than SC/ST households. For example, for the first cohort, the mean net annual farm income per acre of land cultivated per household is Rs 12927.70 for OC, Rs 8075.47 for OBC and Rs 5549.71 for SC/ST households respectively. For this cohort, the mean net annual farm income per acre of land cultivated per household for OC households is 60 per cent more than that of OBC households and 133 per cent more than that of SC/ST households. This transitivity in returns to farm cultivation across the three caste groups is true for every cohort (every cohort in table 2 should be seen independently).

The statistics add to and are in line with the existing literature on differential returns to endowments/characteristics of the households/individuals belonging to different caste categories

with the returns lowest for the households/individuals belonging to SC/ST category. Though, there have been studies which have documented the differential returns, but the documentation is mostly related to education or occupation. A literature search on the issue, however, doesn't result in any study which has methodically estimated the differential nature of farm returns for households belonging to different caste groups in India.

Some other interesting findings (though they are not the focus of this study) which can be observed from the table are the effects of size of total land cultivated and the highest educational attainment in the household on net annual farm income per acre of land cultivated. It can be seen that for the same caste category and the same highest educational attainment in the household, the net annual farm income per acre of land cultivated decreases in general (with rare exceptions) with the increase in total land cultivated. This observation of a kind of inverse relationship between land size and productivity is considered like a 'stylized fact' in Indian Agriculture (Mazumdar 1963; Rao 1963; Sen 1964; Mazumdar 1965; Rao 1966; Bhagwati and Chakravarty 1969; Saini 1969; Banerjee 1999; Ghatak and Roy 2007) and is not pondered upon here. Similarly, it can also be observed that for the same caste category and similar total land cultivated, the net annual farm income per acre of land cultivated increases in general (with rare exceptions) with the increase in highest educational attainment in the household. This is not hard to believe as general awareness in the households about better farm practices will improve with the increase in educational attainment in the household. As the previous case, it is not the focus of this research and therefore is not further deliberated upon.

Coming back to caste based inequality in net annual farm income (per acre of land cultivated), the results are summarized in Table 3. 'Table 3 about here'

Since, the inequality decomposition has been carried out separately for each of the sixteen cohorts the results should be interpreted separately for each cohort. The share of caste

based inequality (between-group component) as a proportion of overall net farm income (per acre of land cultivated) inequality varies from 3 per cent (for the cohorts 13th, 14th and 15th) to 13 per cent (for the 12th Cohort) with a simple average of 7 per cent across different cohorts. It must be noted here that all the cohorts (13th, 14th and 15th) for which the caste based inequality is lowest (3 per cent), have households with the largest land holdings (each household has more than five acres of cultivated land). If the cohorts with the largest land holding (greater than three acres) are not counted then the simple average of caste based inequality across remaining cohorts comes out to be 8 per cent with the range from 5 per cent to 13 per cent across cohorts. How significant are these estimates in terms of their size (whether they are large enough to be considered or not) is debatable and this study's objective is not to join that debate. The sole objective of the present study is to demonstrate the existence and to measure the extent of caste based inequality in returns to farming and it is left to the readers to decide upon the significance of the extent. However, it must be mentioned here that the estimates are very conservative and there is possibility that the share of between-group (caste based) inequality might increase if a more elaborate caste system (e.g. five instead of three) is used.⁹ But a finer division of sample into more groups leads to the general problem of data insufficiency in studies using nonparametric approach as the present one. Further, the approach shouldn't be questioned on this account as it is able to analyse and answer the questions raised in the paper in a meaningful manner while keeping the analysis simple and general for a wider readership. Also, the justification of dividing the households into three caste groups has already been explained and dividing them into even finer categories doesn't add any new insight. Some additional remarks about the results have been provided in the subsequent section which concludes the study.

Conclusion and Discussion

According to the egalitarian conception of society, the circumstances (such as caste) which are beyond the control of an individual should not affect the outcomes for which s/he is striving.

The achievements or outcomes should purely depend on efforts and choices exercised and not on characteristics like caste or religion which are exogenous and are decided at birth. The independence from social characteristics of outcomes like educational attainment or income has always been questioned in India. The present study has tried to explore one aspect of this question and has explored the returns of different caste groups to farm cultivation. In this sense it provides new insights as it has decomposed overall net farm income (per acre of land cultivated) inequality into two components, the components being inequalities due to caste and inequalities due to factors other than caste. The decomposition analysis shows that inequality between castes accounts for as much as 3 per cent to 13 percent (across the different cohorts; the simple average across cohorts being 7 per cent) of overall net farm income (per acre cultivation) inequality.

The average SC/ST and OBC household (or individual) in India have substantial disadvantage in farm income relative to households from OC category in 2004-05. Between the SC/ST and OBC households (individuals) it is the SC/ST households (individuals) which are the most disadvantaged. Considered in the light of the findings of other studies regarding extensive shortfalls of the average SC/ST household (individual) in consumption, education, and other development indices, the scenario that emerges is one of comprehensive and persistent disadvantage for the disadvantaged groups in modern India.

The disadvantage in returns to farming suffered by the disadvantaged groups may be the result of social exclusion in access to public goods (e.g. tube wells, electricity, markets for selling produce etc.). There are a few studies which have documented social heterogeneity or exclusion in access to public goods (Banerjee and Somanathan 2004; Anderson 2005). Anderson (2005) which is based on 120 villages drawn randomly from two (Uttar Pradesh and Bihar) of the poorest states of India specifically documents that the households belonging to lower castes had better access to irrigation only in villages dominated (ownership of majority

land) by non-OC (OBC to be specific).¹⁰ It also suggests that households belonging to OC category do not like to or easily share or trade resources (water) with lower caste (SC/ST and OBC) households.

When there is heterogeneity along caste lines in access to basic public goods and difference in returns to farming based on caste, the policy of land redistribution to achieve greater social equality in rural areas will fail to attain the desired result. Since independence, the Central and State governments have focused on land reforms for reducing social disparity but have failed to accomplish their objectives partly because they fell short of addressing the important issue of differential returns across different social groups. Therefore, the need of the hour is focused policies which acknowledge the phenomenon of disparity across social groups in returns to the land cultivated and try to neutralize it using some kind of affirmative action.

‘Notes’

1. Gang et al. (2007) uses 50th round (1993-94) of the National Sample Survey (NSS) which is a nationally representative survey conducted by National Sample Survey Organization, Govt. of India. Their analysis is centered on the decomposition of the head-count index of poverty between ST, SC and Others into the characteristic component and the structural component whose details are provided above.
2. The land holdings are reported by households in local units. But the survey provides conversion factors for converting the local units into acres which have been used to convert the land holdings into acres.
3. Note that households with less than one acre of cultivated land have not been included in the analysis. This is because there can be large fluctuations in income from unknown reasons, as well as general problem of error in reporting income for very small farmers. However, this will not affect the analysis or results in any ways because the analysis has been done separately for each category and the results on disparity are independent for each individual category. If the category of households with less than one acre of cultivated land would have been included in the analysis, results for one more category had been added to the results but the addition (or omission) doesn't affect results for other categories.
4. Primary corresponds to 5 years and secondary corresponds to 10 years of education.
5. Since every household's (irrespective of religion) caste category has been reported in the survey, the analysis is not confined to Hindu's only but includes households of all religions, which have been divided into the three caste categories.

6. Another point of interest for some readers may be family size, where it can be argued that a larger family size provides more hands to work on the farm, in that case it is worth observing that the mean family size of SC/ST households and OBC households is more than OC households for almost all the sixteen cohorts and therefore it is the households belonging to lower castes which are providing more labour on the farm but getting less in returns. The distribution of family size can be provided on request.

7. See Bourguignon and Ferreira 1979; Shorrocks 1980; Foster and Shneyerov 2000 and Shorrocks and Wan 2005 for the detailed discussion on the inequality measures and the six axioms.

8. I also used Theil's index for checking whether results are sensitive to the type of index (from Generalized Entropy class) used, but the changes were very small and the results were similar.

9. Please refer Shorrocks and Wan (2005) for examining the effect of number of groups on between-group inequality.

10. The villages were of two types; one type with one of the caste from OBC caste group owning majority of land and the other type with a caste from Others caste category group owning majority of land. There was no village which had majority of land owned by a caste from SC/ST category.

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Table 1. *Details of the distribution of rural households into cohorts based on size of land cultivated and highest educational attainment in the household, India (IHDS, 2004-05)*

Cohorts	Land Cultivated by household (acres)	Highest Educational Attainment in the household (years of schooling)
1	Greater than 1 but less than or equal to 2	0
2	Greater than 1 but less than or equal to 2	Greater than 0 but less than or equal to 5
3	Greater than 1 but less than or equal to 2	Greater than 5 but less than or equal to 10
4	Greater than 1 but less than or equal to 2	Greater than 10
5	Greater than 2 but less than or equal to 3	0
6	Greater than 2 but less than or equal to 3	Greater than 0 but less than or equal to 5
7	Greater than 2 but less than or equal to 3	Greater than 5 but less than or equal to 10
8	Greater than 2 but less than or equal to 3	Greater than 10
9	Greater than 3 but less than or equal to 5	0
10	Greater than 3 but less than or equal to 5	Greater than 0 but less than or equal to 5
11	Greater than 3 but less than or equal to 5	Greater than 5 but less than or equal to 10
12	Greater than 3 but less than or equal to 5	Greater than 10
13	Greater than 5	0
14	Greater than 5	Greater than 0 but less than or equal to 5
15	Greater than 5	Greater than 5 but less than or equal to 10
16	Greater than 5	Greater than 10

Table 2. *Descriptive Statistics: Mean household net farm income (annual in Indian Rupees) per acre of land cultivated, India (IHDS, 2004-05)*

Cohorts	Households belonging to Others	Households belonging to OBC	Households belonging to SC/STs	Total
1 st (1<L≤2 & E=0)	12927.70	8075.47	5549.71	8014.74
	172	292	350	814
2 nd (1<L≤2 & 0<E≤5)	11308.25	7686.00	6804.07	8304.63
	149	265	189	603
3 rd (1<L≤2 & 5<E≤10)	20892.25	11343.68	8639.92	13884.44
	405	504	297	1206
4 th (1<L≤2 & E>10)	20720.28	13797.67	14327.52	16947.50
	257	213	114	584
5 th (2<L≤3 & E=0)	10169.14	7028.86	4843.66	6587.30
	80	204	216	500
6 th (2<L≤3 & 0<E≤5)	11843.6	6616.40	4792.65	7147.11
	73	158	110	341
7 th (2<L≤3 & 5<E≤10)	12550.68	8752.20	6614.54	9501.61
	296	403	208	907
8 th (2<L≤3 & E>10)	13977.72	13501.04	6645.30	12532.95
	192	200	80	472
9 th (3<L≤5 & E=0)	10664.23	6468.39	3658.42	5923.01
	57	173	161	391
10 th (3<L≤5 & 0<E≤5)	10621.55	5375.49	5124.64	6621.30
	84	164	88	336
11 th (3<L≤5 & 5<E≤10)	11735.37	8290.25	6163.38	9017.58
	266	370	159	795
12 th (3<L≤5 & E>10)	16659.00	8482.89	5744.98	11148.20
	201	223	95	519
13 th (L>5 & E=0)	6213.27	5208.50	3686.30	4843.12
	83	151	146	380
14 th (L>5 & 0<E≤5)	6806.13	5971.63	3422.83	5572.30
	90	179	85	354

15 th (L>5 & 5<E≤10)	9955.72	7106.30	6066.59	8037.14
	416	542	149	1107
16 th (L>5 & E>10)	12042.47	8937.13	5734.40	9984.39
	419	408	109	936
Total	13598.07	8557.12	6168.65	9555.43
	3240	4449	2556	10245

Note: 1. First row: mean; second row: Observations (number of households)

2. L: total land cultivated by the household; E: highest educational attainment in the household

Table 3. *Inequality decomposition (within-group and between-group, group defined by caste) for each cohort – Mean Log Deviation, India (IHDS, 2004-05)*

Cohorts	Within-group inequality (W)	Between-group inequality or Caste based Inequality (B)	Overall Inequality in net farm income (per acre of land cultivated) (O)	Caste share (%)
1 st (1<L≤2 & E=0)	0.54	0.05	0.59	8
2 nd (1<L≤2 & 0<E ≤5)	0.51	0.03	0.54	6
3 rd (1<L≤2 & 5<E ≤10)	0.64	0.06	0.7	9
4 th (1<L≤2 & E>10)	0.69	0.04	0.73	5
5 th (2<L≤3 & E=0)	0.61	0.04	0.65	6
6 th (2<L≤3 & 0<E ≤5)	0.49	0.06	0.55	11
7 th (2<L≤3 & 5<E ≤10)	0.47	0.03	0.5	6
8 th (2<L≤3 & E>10)	0.59	0.03	0.62	5
9 th (3<L≤5 & E=0)	0.57	0.07	0.64	11
10 th (3<L≤5 & 0<E ≤5)	0.58	0.05	0.63	8
11 th (3<L≤5 & 5<E ≤10)	0.54	0.03	0.57	5
12 th (3<L≤5 & E>10)	0.53	0.08	0.61	13
13 th (L>5 & E=0)	0.66	0.02	0.68	3
14 th (L>5 & 0<E ≤5)	0.83	0.03	0.86	3
15 th (L>5 & 5<E ≤10)	0.57	0.02	0.59	3
16 th (L>5 & E>10)	0.56	0.03	0.59	5

Note: 1. Between-group inequality is nothing but the caste based inequality

2. Caste share (%) = B/O *100

3. L: total land cultivated by the household; E: highest educational attainment in the household