Local institutional structure and clientelistic access to employment: the case of MGNREGS in three states of India*†

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Abstract

This work is a contribution, first, toward measuring and characterizing some features of 'local' institutions and then toward exploring the impact of these institutional features on development-related outcomes mainly at the level of households using primary data collected from 36 sampled villages in the states of Maharashtra, Orissa and (Eastern) Uttar Pradesh in India. We determine the nature of local institutions based on the data on day-to-day economic, social and political interactions of the households residing in each village. We

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identify presence of patron-client relationships from our multidimensional directed interaction network data in some of our sampled villages. Patrons are called elites. The outcome we concentrate on is the households' access to employment under the "the Mahatma Gandhi National Rural Employment Guarantee Scheme" (MGNREGS) programme. Our main findings are that (i) clients of local elites have better access to MGNREGS employment than non-clients and (ii) a household in an elite village, on average, has higher access to MGNREGS employment than a household in a non-elite village.

Keywords and Phrases: Clientelism, Network, MGNREGS

JEL Classification: O12; P47

1 Introduction

This work is a contribution toward identifying the impact of *'local'* institutions on development-related outcomes mainly at the levels of households (at some Indian villages) using primary data collected by ourselves. As would be detailed below, the specific (rural) institutional characteristic we focus on is patron-client relationship and the presence and intensity of that is measured from the data on multidimensional usual or day-to-day interactions between inhabitants in the study villages and their surroundings. The outcome we concentrate on is the households' access to employment under the "the Mahatma Gandhi National Rural Employment Guarantee Scheme" (MGNREGS) programme, the famous workfare programme in India introduced in the last decade.

At least from onwards Acemoglu et al. ([1]), the role of institutions–the rules and conventions underlying and sustaining socio-economic interactions within a social unit - in affecting development-related outcomes has been one major theme of study among economists studying problems of development. Apart from taking institutions in general and considering institutions as an outcome of the persistence of history ([9, 23]) specific components of institutions that have been studied include the prevailing tradition about property rights ([20]), exogenously induced participation of women in local level governance (e.g., [15]) etc. A substantial body of such works has been in the context of India.

Our present research question stems from what we perceive to be a gap in the conceptualization of institutions. Usually variations in (rural, in our context) institutions are seen in terms of aggregate features exogenous to the day-to-day functioning of a village society: examples being the existence or otherwise of bodies for local governance (called *panchayats* in India), existence or otherwise of a formal market within a village, rules of entitlement to land-ownership etc. We reckon that such conceptualization of institutions is more *formal* in nature. Mere existence of a market does not entail what is commonly understood to be the central feature of a market economy: freedom to trade. Similarly, mere existence of electoral bodies and rulebooks governing them does not imply the existence of democratic political processes as has been explored and shown in numerous works on themes like vote buying or political clientelism; one recent example in context of India being Anderson et al. ([4]). Therefore, we consider it to be more illuminating to measure the quality of institutions from data on the day-to-day interactions of agents in the spheres of economy, society and politics. This work is geared toward that direction. The aspect of institution we focus on is the structure of multidimensional dependence in these spheres: whether such dependence is concentrated on a few 'powerful' entities dominating over a good many of households or whether this is distributed in a sufficiently diffuse manner. Moreover, our emphasis is on such dependence at *local* level, roughly at the level of the villages of interest and the neighbouring villages and town(s). Note that given our research goal, we were to introduce an identifier for localized institutional variations and single out some channels through which such variations should work.

The basis for constructing our institutional variation is the multidimensional directed network where the primary nodes are the sampled households (HH hereafter) in each village. However households can have directed links to households or entities (like the village church committee or local credit cooperatives) which would be outside our sample households. We gathered information on links the sample households have for help in spheres of day-to-day economic interactions (like whom the HH depends for getting productive inputs, for selling of outputs if any, for loans etc), social interactions (like whom the HH approaches for advices on family matters and disputes, religious matters etc) as well as political ones (like whom the HH accompanies to political events if any etc). Given this primitive multidimensional network we define various variants of consequent derived unidimensional *dependence* networks. The main underlying principle for constructing these dependence

networks is that a node A is 'dependent', that is, has a directed edge on another node B if and only if A has to depend on B sufficiently strongly (in a well-defined manner the details of which are given in the following section) and the converse is not true. An entity with sufficiently many such dependents is called a local *elite*. A village having at least one local elite is called an elite village. We call a HH which is dependent on a local elite a *client*. The institutional variations we consider in this work are in terms of these elites. (Of course, we consider several variations of this main underlying idea).

Therefore, the institutional framework prevailing in a village, in our conceptualization, is not merely the result of the existence of any exogenously specified rule or body. Rather, it is an aggregate outcome of everyday interactions of the general population within the village. Moreover, unlike, e.g., in Banerjee et al. ([8]) we do not ask the respondents something like "who the important persons in the village are as per their impression" upfront. Rather, we derive the set of such "important" entities from the revealed behaviour of the respondents themselves in several spheres of their actual lived experiences.

Moreover, the noticeable feature of what we call an elite village is that such a village consists of a small number of persons (in our data we find them to be usually less than four or five) who have control over a number of households in terms of crucial economic dimensions (like providing credit or employment) and very often these same persons dominate in the spheres of social interactions as well as in political arenas around the village. In many cases the village *sarpanch/pradhan* (head) happens to be *one* such person. In return, a client HH would be dependent on its patron for accessing several such services and provide, perhaps, economic and political allegiance [1]. Very similar institutional features are corroborated by Ananthpur et al ([3]) in their micro-study in Karnataka (a state different from the ones from which we collected data).

Given the rather lopsided structure of dependence (in crucial dimensions) of a non-elite common household living within an elite village one might expect a strong degree of extraction of economic and political rent by the local elites in these villages from such common persons. Moreover, dependence, presumably desired by the local elites, might be sustained by the level of development within the village remaining low as that would imply less em-

[1] In a companion work, we are exploring in depth how the elites operate in our sample villages and nearby.

powerment of the ordinary villagers. Therefore, we might expect reasonably that the local institutional frameworks in elite and non-elite villages will be different.

For identifying the impact of the institution in elite villages, especially of local elites, one of the channels we consider through which this might have an effect at household levels is that of allocation of MGNREGS jobs [2]. The scheme and several issues related to it, especially its impact in different spheres of Indian rural economy have attracted a good deal of attention. It is well known that job-allocation under this scheme to the different HHs in a village is controlled by the village panchayat and therefore, the local elites, the persons wielding substantial lopsided dependence on themselves should have a good deal of power in determining who might get jobs under this scheme (a point emphasized in [3] as well). Therefore an elite, who is likely to have a say in allocation of MGNREGS jobs, may influence the job provision for a client of his. He might furnish support to his client by providing him access to relatively more MGNREGS jobs. Therefore, a client, controlling for other determinants, should have higher probability of getting MGNREGS jobs as well as more job-days than a non-client. We test whether this conjecture might be true using our data.

For studying these we collected data from 36 villages in three states of India (Maharashtra, Orissa and the (eastern half) of Uttar Pradesh (UP)) using personal interviews. The survey is named "Local Institutions and Rural Economic Performances in Three States of India" (LIREP). Detail of sample design can be found in Appendix B.

We construct our measure of local institutions: an index measuring the presence and intensity of patron-client dependence. Then we find that indeed, with increase in intensity of "elitism" in a village, a HH, controlling for other factors, is more likely to get MGNREGS jobs. Then we confine attention only to villages with local elites and find that in comparison to a non-client HH, a client HH has higher probability of getting MGNREGS jobs as well as more job-days. In other words, the kind of local institution that we measure seems to make a difference and the channel we have explored is one of the channels through which such an institution seems to

[2]As is well known, the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) is supposed to provide a maximum of one hundred days of unskilled manual work to each rural household (at a government stipulated minimum wage) on demand. We refer to the official website of this scheme-http://www.nrega.nic.in/netnrega/home.aspx for details.

affect development-related outcomes. As we discuss in detail in Section 6 below, this work contributes not only to the literature on quantifying nature of institutions and measuring their impacts, but also to the bodies of literature on some other themes as well. These themes include measuring the value of connections or important nodes in the literature on networks, political economy of clientelism and, of course, to the specific literature on factors determining MGNREGS job allocation.

The next section provides details of how we measure the local institutional characteristic of our interest. Features of our data and the other relevant variables are discussed in Section 3. Section 4 provides the conceptual framework and Section 5 presents our main results. Section 6 discusses several checks and variations we performed for looking into the robustness of our findings. We survey some important items of the relevant streams of literature in Section 7 and highlight the possible novelty and significance of our contribution in light of those. Figures and Tables are collected at the end.

2 Localized Institution: Dependence, Elites, Clients

Conceptual formalization and quantification of 'localized dependence' is quite rare in Economics. Our formalization is based on the following core components. First, dependence is embedded in day to day activities, both economic and socio-political. Access to inputs of production, market access for products, dispute resolution and participation in political process are a few examples of such activities. The second aspect of dependence is personalized interaction. This is distinct from formal institutional interactions. Borrowing from banks, approaching police station for dispute resolution etc. are instances of formal institutional interactions, while borrowing from informal lenders, approaching local political leaders for dispute resolution are personalized interactions. These two aspects together imply that the dependence structure we are exploring is essentially localized in nature. Finally, high concentration and interlinkage of dependence links are indicators of stronger localized power.

Recall that the primitive in this context in our set-up are the households' links for getting help in social, economic and political spheres. If HH M

receives an economic, social or political service from HH N, then HH M is said to have an **outgoing service link** to household N. We also classify outgoing service links into two groups - *crucial and non-crucial* - based on their relative importance. This classification is based on our perception and judgment. For instance, a service-link of seeking advice for resolution of household disputes is categorized as non-crucial whereas seeking advice for profession related disputes is categorized as crucial. Admittedly, this classification is subjective but not arbitrary. The full list of services, classified as (i) economic/social/political and (ii) crucial/non-crucial can be found in Table 2.1. Since we ask survey households whether such services are reciprocated, we also have data on outgoing links from Household N to Household M. In case, Household M is also part of our sample, we have an independent verification of such claims (we could not make such cross-verification *in general* though).[3].

Note that, in our network data, there can be multiple such service-links between two nodes:i.e., households. First we aggregate these to a single dimension, called **dependence-connection**. To capture relative strength of dependence relation, we classify dependence-connections into three types.
Type A: HH M is said to have Type A outgoing dependence-connection to HH N only if M has exactly one crucial outgoing service-link to N. A single non-crucial link is unlikely to be an indicator of clientelistic relation.
Type B: HH M is said to have Type B outgoing dependence-connection to HH N only if M has at least two outgoing links to N that are of similar kind, either all economic or all social or all political. This captures interlinkages in received services .
Type C: HH M is said to have Type C outgoing connection to HH N only if (i) M has at least two outgoing links to N and (ii) not all of them are similar kind (economic/social/political) of services. This captures interlinkage in different spheres of daily/usual interactions.

Since (clientelistic) dependence should be conceived as an asymmetric power relation (in contrast to a reciprocal relationship like friendship), we exclude all bilateral, mutual outgoing dependence-connections from our network. Directed cycles of higher length do not appear in our data. Thus HH M is said to be **dependent** on HH N if (i) HH M has an outgoing dependence-connection of at least one type to HH N and (ii) HH N does not have any

[3]In case of mismatch, though such instances are rare, claims of the household which has received the service is accepted

outgoing dependence-connection to HH M. Finally, we define a weighting scheme to complete our description of dependence network. Interlinkage of service provision in multiple types of spheres is assigned the maximum weight, followed by interlinkage in one sphere and that by only one crucial dependence-connection.
$W_{MN} = 3$: (i) HH M is dependent on HH N and (ii) M has Type C outgoing dependence-connection to N.
$W_{MN} = 2$: (i) HH M is dependent on HH N and (ii) M has Type B outgoing dependence-connection to N.
$W_{MN} = 1$: (i) HH M is dependent on HH N and (ii) M has Type A outgoing dependence-connection to N.
otherwise, $W_{MN} = 0$ This completes our description of (weighted, directed, single dimensional) network of dependence relations. In Diagram 2.1 we plot outgoing links of one of our survey villages.

Next we use network data to identify the presence and pattern of clientelist network of sampled villages. If a clientelist network is present then it would be characterized by patrons and clients. It is expected that clients will be dependent on patron(s) for various (often interlinked) services and a number of clients will be dependent on a patron. To this end, we define a patron, called **elite** as follows. If more than five percent of the sampled households are dependent on a household X then X is potentially an important patronage-provider in the village and is called an elite. This captures concentration of dependence in our network data. A household which is dependent on at least one elite is called a **client**. Any household, which is neither a client nor an elite will be called **non-client**. In Diagram 2.2 we plot dependence-connection network of two villages, one with presence of elites and another without.

However, since we have not done census for each of the sample villages, we only see the village dependence networks partially. We can not rule out presence of additional hubs in dependence network and our elite identification could be incomplete. Thus it is possible that some households in our sample who justifiably can be called clients are getting incorrectly categorized as non-clients [4]. In some regression specification, we use **degree of dependence** as an alternative to client/non-client categorization. Degree of dependence of a Household M is the total number households on which M is dependent,

[4]Our derived network variable being somewhat complicated, we do not have any correction for sampled links (as in [14]).

irrespective of whether the service provider is an elite or not. Formally, *degree of dependence* of Household M is defined as $D_M = |\{N|W_{MN} > 0\}|$.

To capture pervasiveness of patron-client relation in a village we use the following index, $nclscore = \frac{1}{n}\sum_{\{i|i \text{ is a client of elite } j\}} W_{ij}$, where n is the sample size and W_{ij} is described as above. Note that the we are adding weights only over links where i is a client of an elite j. Intuitively, we ignore all dependence links where the service provider is not a hub of the dependence network. Naturally, those villages where there is no such hub, that is there is no elite, have $nclscore = 0$. We use $nclscore$ as an index for measuring 'degree of elitism' in a village. Table 2.2 provides the frequency distribution of $nclscore$ by state.

In our sample, 13 villages have no-elites and 23 villages have at least one elite. We have identified 54 elites and 511 clients in 23 villages. Table 2.3 documents a few characteristics of elites and clients. Here caste, religion and occupational information of elites are based on household reports. We have conducted a survey of elite households separately to understand the source of their power and inter-relation between the elites in a companion paper. Table 2.3 underscore the asymmetric nature of dependence links. Most of the elites are either upper caste or OBC whereas most clients are SC, ST and OBC. Elites are mostly engaged in farming and business whereas almost half of the clients are labourers. Our dependence network is quite different from other social networks (for example friendship) that have homophily as a primary feature.

3 Data Description

In this section we provide detailed definitions of other explanatory variables and the dependent variables. MGNREGS provides a maximum of hundred days of unskilled manual work to each rural household at a government stipulated minimum wage. We consider two indices of access to MGNREGS employment; (i) number of days a household had MGNREGS employment the year prior to our survey (to be precise, within 13 months before our survey) and (ii) whether a household has ever participated in MGNREGS work since its inception. We call these indices *wdaysnum* and *wdaysever* respectively. We have *wdaysever* data for our entire sample but *wdaysnum* only for the first phase of our survey, that is for Maharashtra and Orissa. This is

due to a change in survey question in second phase where instead of asking the exact number of days worked last year, we used intervals. Table 3.1 and Diagram 3.1 provide descriptive statistics of MGNREGS employment. Note that 67% of all client households have worked in MGNREGS at least once, whereas only 44% non-client households have ever worked in MGNREGS. In last 13 months, prior to our survey, clients have received about 20 days of MGNREGS work, while non-clients got 13.5 days of work, on average.

MGNREGS work is supposed to be available on demand. However, it has been widely documented that the program is not demand-driven in practice and households get far less than their stipulated quota of hundred days of work (see, e.g., Ravallion et al. (2015)). In any case, to control for demand side factors we use various household and village characteristics in our regressions. Below we provide the list of explanatory variables, other than the network-related ones which we have already discussed in the previous sub-section.

Caste/Religion of a household: We classify the various castes/religion into five categories. Hindus are divided into three categories 'Lower' (including SC/ST/NT), 'OBC' and 'Upper' (General and Brahmin). If a household has reported jati name instead of the above four categories we match it with administrative lists of SC,ST,NT and OBC lists for the corresponding states. For religion, we use self-reported religion. Since apart from Hindu and Muslim, there are very few households of other religions, we use 'Muslim' as our fourth category and club all other religion as 'Other'.

We use several variables to capture the economic condition of a household. These are, land ownership, an index of non-land assets and occupation. Amount of land owned by a household is measured in acres. Non-land asset for a household is measured by aggregating indicators of 6 types of asset-items so that the score for each household varies between 0 and 6. These six items are ownership of a pucca house for residence in the village, (additionally) owning a house in a town or a city, possessing television, possessing some kind of automobile, having expensive bed (palang) in the premises and owning trees.

We classify the main occupation (self-reported by the HH) into two categories: stable and other. *Stable* occupation includes running a business/factory/ production unit and/or salaried position in some organization. Other occupation primarily consists of farming and working as an agricultural or non agricultural labourer; to a small extent it involves occupations like collection of forest product and somewhat casual types of jobs as working as a priest etc.

Further, availability of informal insurance is captured through a *remittance from outside* variable. This is a dummy, which takes the value 1 if someone living outside the village sends money to the household. Since MGNREGS work involves only unskilled manual labour, presence of less-educated but able-bodied members in a household who may not get an opportunity to work in the formal sector, can be an important demand side factor. We use number of household members between age 16 and 60 years and educated up to secondary level at most, as an indicator for this determinant. Naturally, education is also important for awareness of a household about its legal rights as well as government schemes. We use the level of the maximum education among all the members of a household as the corresponding explanatory variable. This can take three values: up to higher secondary education, undergraduation or equivalent degrees and above undergraduation.

Apart from its position in clientelistic network, a household may have other formal and informal channels through which it may exert influence on collective decisions. Membership of formal institutional position such as political parties and local government, capacity to organize collective actions, can earn a household a larger share of MGNREGS work compared to others. We use three dummy variables to capture these channels. First, *Socio-political influence*, which takes the value 1 if a household has at least one member who either is (was) a member of local government or is a member of a political party/labour union. We also use two more dummy variables to capture the 'voice' of a household in community matters. *Advice given* takes the value 1 if a household mediates in community disputes, while *Experience with local administration* takes the value 1 if a household has experience of visiting administrative offices or other such formal institutions.

Some items of village-level data were collected from the village pradhan/sarpanch (the head of the local government) or, in her absence, from any other panchayat office-holder present. These were collected simultaneously with the main household survey. Some other items of data have been taken from the Census of India, 2011 or other governmental sources. Village characteristics used in our regressions - to capture the village-level agrarian condition likely to affect our dependent variables - are as follows: distance to the nearest town, average rainfall in the neighborhood of the village, the net sown area of the village which is irrigated and percentage of households in the village for which agriculture and/or working as agricultural labour is the main occupation.

A list of all variables can be found in Appendix A.

4 Conceptual Framework and Hypotheses

Our primary conjecture is that clientelist power structure is an important determinant of availability and allocation of MGNREGS work. First, we discuss the conceptual framework of our analysis.

We have already mentioned that MGNREGS work is usually planned and executed by the local government and bureaucracy. Although peoples' participation in planning through gram sabhas is recommended and work allocation is supposed to be demand driven, in practice, common villagers have very little control over the process (see, for example, [21]). A deserving household, in practice, is not guaranteed to receive MGNREGS work - MGNREGS card (say unlike BPL card, for subsidized food grains) is not an entitlement but is only used to keep record. Moreover, since it was supposed to be demand driven , there is also no mandated rationing rule for allocation of MGNREGS work between households. It is quite possible that some households are offered MGNREGS work every year while others are denied. These along with the perishable nature of the benefit (say unlike Indira Awas Yojana, where a household receive one-time grant to build pakka house); makes MGNREGS work highly conducive for elite capture. Elites, who control socio-political institutions of the village, can allocate MGNREGS work to their clients as a tool for extending patronage, in return of, say, their political support in election or village administration (see, for example, [12]). Such support can be useful for an elite to ward off potential political entrants and challages to rent extraction.

However, MGNREGS work may also improve the outside option for agricultural workers and can potentially increase the agricultural wage. Some academic studies seem to suggest that there was a rise in real casual laborer wages due to MGNREGS, with estimates ranging from 4% to 8% ([22, 6]). This, however, will squeeze agricultural profit and it is likely that large and middle peasants, who primarily live on agricultural profit, may oppose the implementation of MGNREGS ([7]). Therefore equilibrium implementation of MGNREGS in a village will depend on two opposite forces - landed peasants opposition to its implementation and local political elites favouring it as a channel for patronage provision - and their balance of power in local institution.

We use our measure of institutional quality as an identifier of balance of power in local institutions. Villages, where dependence network is perva-

sive and elites are present, we expect a small group to exercise control over resources and local government. Whereas absence of elite and lack of dependence relations are indicative of diffused power structure, which is consistent with a control of relatively larger group of rich and middle peasants. This leads us to the following hypotheses

(i) On average, a resident is likely to get more MGNREGS work in a village where patron-client relation is more pervasive.

(ii) In villages where patron-client relation is pervasive, a client is likely to get more MGNREGS work in comparison to a non-client

5 Main Results

Hypothesis (i):
The sample consists of all the households of all villages for which there is no missing information. In Table 5.1, we report the results of OLS regression with $wdaysever$/ $wdaysnum$ as the dependent variables and the degree of elitism as the main explanatory variable of interest. The regression equation has the following form

$$y_{ij} = \alpha_0 + \alpha_1 nclscore_j + \alpha_2 X_{ij} + \alpha_3 Z_j + \varepsilon_{ij} \tag{1}$$

Where y_{ij} is the MGNREGS employment variable for household i in village j; $nclscore_j$ measures the degree of elitism in village j, X_{ij} represents the household-level controls and Z_j represents the village-level controls. The errors are clustered at the village level. We find that $nclscore$ has a positive and significant impact on $wdaysever$. A unit increase in $nclscore$ in a village increases the probability of a household having ever worked in MGNREGS by 0.34. By replacing $nclscore$ by other variants, such as, a dummy for elite villages (which takes value 1 if a village has at least one elite, and 0 otherwise) does not change the direction of association.

However, the result for $wdaysnum$ shows that this effect is not significant, although the corresponding coefficients still remain positive. One explanation of this slightly different behaviour of $wdaysnum$ and $wdaysever$ may be as follows. Note that $wdaysnum$ index is based on last 13 months, whereas $wdaysever$ captures the entire period since the introduction of MGNREGS. It is possible that elites are distributing MGNREGS work to client households

across years, so some client households receive MGNREGS work in year t , some in $t+1$ and so on. This is very likely, particularly because of the fact that total MGNREGS work received by a village (as documented in Table 3.1), on average, is pretty low.

We verify the above results with hierarchical modeling (see, e.g., [13]). The level 1 is that of the households in each village and the higher level is that of the villages. The results remain exactly the same. See Table 5.2 and Table 5.3.

Hypothesis (ii):
For analyzing the impact of being a client household on getting MGNREGS employment, we restrict our sample to the elite villages (there are 23 such villages), that is to those villages with at least one elite (and hence clients). This restriction is required because we want to measure the impact of being a client in securing MGNREGS jobs in comparison to being a non-client within the same institutional environment of an (elite) village. Moreover, to ensure that the village has some non-negligible implementation of the MGNREGS programme., we restrict our regression of those villages for which *wdaysever* (similarly for *wdaynum*) takes non-zero values for at least 5 households. This restricts our sample to 22 villages for *wdaysever* and 10 villages for *wdaysnum*. The basic regression equation has the following form

$$y_{ij} = \beta_0 + \beta_1 client_{ij} + \alpha_2 X_{ij} + \alpha_3 Z_j + \varepsilon_{ij} \tag{2}$$

where $client_{ij}$ is a dummy variable which takes value 1 if households i of village j is a client and 0 otherwise. The errors are clustered at the village level. We also use state dummy to control state-specific effects.

Client dummy has positive and significant effect on both *wdaysever* and *wdaysnum*. See Model 1 in Table 5.4 and Model 1 in Table 5.5 for results of *wdaysever* and *wdaysnum* respectively. Clients are 8% more likely to work in MGNREGS ever compared to non-clients. Note that about 44% non-client household in these villages have ever worked in MGNREGS - that is clients are 18% more likely to get work than the rest. Clients also got more than 6 extra days of work compared to non-clients in 13 months prior to our survey. Non-clients, on average, received 13 days of work in this period, which means clients got 50% more work than non-clients. Since for many households *wdaysnum* is zero (note that for non-client households median is 0), we run TOBIT regression, which also shows positive and significant client effect (see Table 5.6).

Model 2 in each of the above Tables is obtained by replacing our main variable of interest, client dummy variable by *degree of dependence*. The positive effect of clientelism on *wdaysever* persists but for *wdaysnum*, *degree of dependence* does not have significant positive effect any more. There are two important differences between client dummy and *degree of dependence*. First, as was already mentioned, we may fail to identify some elites because we use sampling rather than census. In this respect *degree of dependence* is a more reliable index than client dummy. However client dummy captures the importance of being dependent on an elite compared to being dependent on not so influential person. To understand this difference more clearly, we run the basic regression, where households are divided into three categories - households which are not dependent on any other household (of any type), household which are dependent (of some type) on another household - but is not dependent on an elite, households which are dependent on an elite - that is clients. These results are available presented in Model 3 of Table 5.4 and Table 5.5. Whereas the second and third categories, that is, dependent but not client and client, have significant and positive effect on *wdaysever*; only client has positive and significant effect on *wdaysnum*.

Next we reckon that allocation of MGNREGS work being a politico-administrative decision at the village level, a local elite with experience/connection with formal political activities might have greater influence in securing such jobs to their clients. In Model 4 of the above regression tables, we divide the households in three categories, non-client, client of an elite who either is/was part of local government or is a member of a political party, and client of an elite with no political connection/affiliation. We find our conjecture to be true - clients of political elites have significantly higher *wdaysever* compared to non-clients while clients of non-political elites are not significantly different from non-clients. However in *wdaysnum* we find similar positive significant effect on both types of clients (political and non-political).

Further it has been observed that in rural India horizontal linkages through caste results in economic gains (e.g. [25]) for a household. Therefore, we check whether a client of the same caste as the village pradhan/sarpanch gets significantly more MGNREGS jobs. Here we divide the households into four groups based on the Cartesian product of the following characteristics - clients/non clients, same caste/different caste as that of the panchayat pradhan (head of village administration). Model 5, in Table 5.4 and Table 5.5, show that only clients who are of same caste as panchayat pradhan get signifi-

cantly higher *wdaysnum* and *wdaysever* compared to the (omitted category) non-clients who are of different caste.

6 Further Results: Checking for Robustness and Alternative Explanations

Results in the previous section suggest that clientelism affects both the availability and allocation of MGNREGS jobs. However, alternative explanations, a priori, could be consistent with our findings. In this section, we try to rule out such possibilities.

First, it is possible that although elites are providing MGNREGS work to their clients but it is merely due to name recognition rather than any underlying political-economic calculations. It has been observed that clientelistic patronage tend to use perishable consumables, such as temporary jobs, to retain patron's control (see [11]) over the clients. In contrast, a one-time lump-sum favour is useless as a commitment device. If biased allocation of MGNREGS work is merely due to name recognition, then we shall expect a similar pattern for one-time welfare benefits like BPL cards and assistance through Indira Awas Yojana. We run regressions, which are otherwise identical to our previous analysis, on one-time benefits. We find that client-status indicating variables are not significant any more. This is consistent with clientelism explanation. See Table 6.1 for detail result.

Next, it is also possible that awareness rather than clientelism is driving our results. Clients, being connected with elites, perhaps, are better informed about MGNREGS work compared to non-clients. To look into this possibility, we use an inde of awareness about the MGNREGS scheme as a dependent variable and run a regression, exactly similar to our basic specification 2. We find that client dummy is not significant; in fact, coefficient of client dummy is negative. See Table 6.2 for detail.

Finally, our key household-level explanatory variable - client dummy- is potentially endogenous. There can exist unobservable household characteristics, such as household preferences, which may induce a household both to have dependence connection with influential people around a village as well as be prone for taking up workfare jobs. To take care of that we introduce the following binary variable, called *landlord heritage* as an instrument for client-status. The variable *landlord heritage* takes the value 1 if the household is

found to have any outgoing service link (and not necessarily any dependence connection) to a household which has been reported to be of landlord status or royal origin. The underlying idea is that such a link, is likely to be correlated with client status but is unlikely to affect MGNREGS allocation because *landlord heritage* links predates MGNREGS scheme. We understand that our instrument is not satisfactory, it may have similar endogeneity problem as the client dummy. We find that Hausman-Wu test with respect to this IV does not reject the hypothesis that our explanatory variable client status is exogenous. However, with this IV, client status is not significant any more although the effect of client status on MGNREGS outcomes still remain positive. This result of 2SLS is presented in Table 6.3.

The items of work still ongoing is searching for better IVs and attempting to provide partial identification of the impact of the client variable.

7 Existing Literature and Our Contribution

As we mentioned in the Introduction, this work contributes to several streams of research. Below we mention the significant works related to this work and remark on what new we introduce to the existing literature.

Impact of institutions on development-related outcomes

We repeat that one of our central goals is to emphasize studies in "measuring" institutions *not in terms of some exogenously given characteristics* but *endogenously*, by using data on day-to-day interactions as the primitive. In this respect our work is different from apparently similar works like Acemoglu et al. ([2]) which looks into the impact of connection with "elites". "Elites" in their case are historically given. Moreover, unlike, for example, as in Goldstein and Udry ([20]) we do not measure the impact of having power only in the sphere of formal politics (more on this, especially in the context of allocation of MGNREGS jobs, below). We conceptualize the exercise of power (and the reciprocal idea of dependence) as dominance in several dimensions.

Value of connections or important nodes

A set of literature exists on the value or impact of connections: very notable among them Bandeira et al. ([10]), Munshi and Rosenzweig ([25]). Our contribution, naturally, falls also into this terrain of research. We find that it is not that merely connections matter but connection with (endogenously) powerful entities matters. Banerjee et al. ([8]) is especially notable in our context as it also explores the role of "powerful" nodes. However, the kinds of day-to-day socio-economic relations they took as primitive are more or less "symmetric": i.e., links for their study represent "friendship". In contradistinction, we, by our research question, explicitly concentrate on "asymmetric" dependence.

Political economy of clientelism

Relatively recently a body of works has developed analyzing the impact of clientelism (in rural India) mainly on electoral outcomes ([11, 4, 5]). However, the patrons in these literature are exogenous: mainly being powerful functionaries in the local panchayats. In contrast, we, while identifying the elites, take into account and emphasize on the possible structure of multidimensional dependence. This should be interesting as we have found that being client of an elite who does not hold any local political power explicitly may also be effective. The fact that persons without any formal political positions, but powerful through other channels (like economic) can affect politico-administrative functions in rural India is also emphasized in Anantpur et al. ([3]) which is in conformity with our findings. Here we might note one more point: in Anderson et al. ([5]) they find that in the villages where elites, as identified by them (from dominant Maratha castes), wield political power, pro-poor guaranteed employment gets suppressed. We find the opposite for the same state Maharashtra: i.e., we find that as the "degree of elitism" goes up, a household is likely to get more MGNREGS employment. We guess that this might be due to the different kinds of definitions used by us for defining elites and the degree of elitism.

Allocation of MGNREGS jobs

MGNREGS, being the largest of such workfare programmes ever, has attracted a lot of analysis. While much of the existing analyses deal with the *results* of this intervention (e.g., [22, 24]) there is a small set of literature dealing with factors affecting allocation of NREGS jobs. The work closest

to ours in this regard is Das ([16]). Studying a few villages in a district in West Bengal (a state in India) he found evidence of the positive impact of "political" clientelism in securing such jobs–"households, which are politically active and supporters of the local ruling political party, are more likely to receive the benefits in terms of participation, number of days of work and earnings from the program". Dey and Bedi ([17]) reinforce such a finding (again for West Bengal): they find that "during the period covered by our survey, the right populist party- Trinomool Cngress (TMC) ruled Gram Panchayats (GP) promoted more political clientelism through distributing MGNREGS work than did the Communist Party of India-Marxist (CPIM) or Left GPs" (however, they also report that this effect is attenuating over time).

Our study generalizes such findings in several dimensions. First, we find such evidence for a larger sample spreading over three states of India with quite diverse economic and political histories. Next, we find that not only dependence on elites with formal political power entails in securing better MGNREGS job-prospects, but also, elites with no such formal political positions are also able to extend clientelism in form of such jobs.This, we repeat, seems to be in conformity with Ananthpur et al ([3]) that traditionally dominant households, even without formal positions in political office, can still influence decisions of local governments. Here we also mention the recent work by Dey and Imai ([18]) which seems complementary to our findings. Dey and Imai find that increased participation in MGNREGS positively affects getting of local credit at the household level. That may precisely be owing to the possibility that at least a section of such creditors, being local elites, provide more jobs to their clients to ensure smooth repayment of debt which is in conformity to our findings.

Our work also partially reinforce the findings in a growing literature on the presence of corruption in the MGNREGS programme (e.g., [26]).

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Tables and Diagrams

Table 2.1: Classification of services by type

Services	Economic, Social or Political	Crucial or Non crucial
Lease-in land or sharecropping	Economic	Crucial
Purchase input of production	Economic	Not crucial
Sale output	Economic	Crucial
Getting employment	Economic	Crucial
Getting informal credit	Economic	Crucial
Paying bribe for governmental welfare services	Economic	Crucial
Assistance for welfare	Political	Crucial
Getting *information* about MGNREGS	Economic	Not crucial
Household related dispute mediation	Social	Not crucial
Employment related dispute mediation	Social	Crucial
Guidance on political matter (like whom to vote or accompanying to political meetings or rallies)	Political	Crucial
Guidance on religious matter	Social	Not crucial

Table 2.2: State-wise frequency distribution of *NCL_SCORE*

State	$\mathbf{NCL\_SCORE = 0}$	$\mathbf{0 < NCL\_SCORE \leq 0.2}$	$\mathbf{NCL\_SCORE > 0.2}$
Maharashtra	6	2	4
Orissa	3	4	5
Eastern UP	4	2	6

Table 2.3: Elite and client characteristics

	Elite	Client
Caste and religion		
Upper caste	49%	8%
OBC	31%	44%
Other caste and religion	20%	48%
Occupation		
Farming or Business	96%	56%
Other	4%	44%
Mean of land ownership in acres	3.9	1.3
SD of land ownership in acres	3.9	2.0
Mean of non-land assets (wealth indicator)	3.4	1.6
SD of non-land assets (wealth indicator)	1.3	1.2

Table 3.1: Summary statistics of NREGS days worked by client status

	Client	Non-client (Elite villages only)	Non-client (all villages)
Proportion ever did NREGS work	67%	44%	41%
NREGS days worked in the last 13 months			
Mean	19.8	13.3	13.5
Median	15.0	0	0
SD	23.0	23.6	24.5

Table 5.1: Estimated coefficients and p-values from models of NREGA days worked in the last 13 months and ever worked for NREGS estimated using OLS and LPM, respectively

	Ever worked for NREGS		Number of days worked for NREGS in the last 13 months	
	Coefficient	p-value	Coefficient	p-value
Household level characteristics				
Caste (Ref: SC/ST)				
Upper	-0.16+	0.06	-6.1	0.16
Muslim	-0.26**	0	-4.62	0.16
OBC	-0.05	0.3	0.1	0.97
Other	0.01	0.93	-1.1	0.67
Land owned in acres	0	0.76	-0.24+	0.07
Number of non-land assets owned	-0.02+	0.1	-0.17	0.82
Highest education in the household (Omitted: Completed class 12 or less)				
Bachelors	-0.09**	0	-1.38	0.27
Higher than Bachelors	-0.13**	0	-2.96+	0.08
No. of 16-59yr olds in the household with low education (completed less than class 11)	0.02**	0	0.68*	0.04
In a stable occupation (Artisans or have a factory, Shop-keeper or running business of some type, Working at an office for a salary)	-0.10**	0	-3.85+	0.06
If at least one household member lives away and sends money home	0.01	0.73	7.11**	0
If at least one household member is or was a Panchayat or a political party member	-0.01	0.86	0.03	0.99
If head of household had given advice to villagers or workers on own farm or business	0.03	0.14	2.21	0.33
If the household has ever availed of the services of the police station or block office	0.07*	0.02	2.64	0.26
Village level characteristics				
Distance of the village from nearest town in KM	0	0.42	0.07	0.81
Proportion of village whose main occupation is Cultivation or Agricultural Labourer	-0.06	0.68	-7.27	0.36
Average Rainfall in village	-0.00*	0.02	-0.00*	0.02
Fraction of net sown area irrigated	-0.17+	0.07	-3.23	0.56

State (Omitted: Maharashtra)				
Odisha	0.09	0.22	2.81	0.51
Uttar Pradesh	0.06	0.5		
NclScore	0.34**	0	6.14	0.12
Constant	0.49**	0	13.68+	0.09
No. of Observations	3344		2231	
R-squared	0.252		0.113	

Robust standard errors
+ p<0.10 * p<0.05 ** p<.01

Table 5.2: Estimated coefficients and p-values from a multi-level model of ever did NREGS work

	Random Intercept Model		Random Slopes Model	
	Coefficient	p-value	Coefficient	p-value
Household level characteristics				
Caste (Ref: SC/ST)				
Upper	-0.22**	0	-0.21**	0
Muslim	-0.20**	0	-0.20**	0
OBC	-0.10**	0	-0.10**	0
Other	-0.07	0.19	-0.07	0.17
Land owned in acres	-0.01*	0.03	-0.01*	0.04
Number of non-land assets owned	-0.01*	0.02	-0.01*	0.02
Highest education in the household (Omitted: Completed class 12 or less)				
Bachelors	-0.05*	0.02	-0.05*	0.02
Higher than Bachelors	-0.10**	0	-0.09**	0.01
No. of 16-59yr olds in the household with low education (completed less than class 11)	0.03**	0	0.03**	0
In a stable occupation (Artisans or have a factory, Shop-keeper or running business of some type, Working at an office for a salary)	-0.09**	0	-0.10**	0
If at least one household member lives away and sends money home	0	0.93	0	0.82
If at least one household member is or was a Panchayat or a political party member	0	0.87	0.01	0.81
If head of household had given advice to	0.04*	0.02	0.04*	0.02

villagers or workers on own farm or business				
If the household has ever availed of the services of the police station or block office	0.06**	0	0.06**	0
Village level characteristics				
Distance of the village from nearest town in KM	0	0.26	0	0.15
Proportion of village whose main occupation is Cultivation or Agricultural Labourer	-0.01	0.96	0.01	0.94
Average Rainfall in village	-0.00+	0.09	0	0.27
Fraction of net sown area irrigated	-0.18+	0.1	-0.20+	0.05
State (Omitted: Maharashtra)				
Odisha	0.1	0.32	0.07	0.44
Uttar Pradesh	0.06	0.49	0.02	0.85
NclScore	0.34**	0	0.34**	0
Constant	0.46**	0.01	0.44**	0.01
No. of Observations	3344		3344	
lns1_1_1	-1.77	.	-3.63	.
lnsig_e	-0.95	.	-0.96	.
lns1_1_2			-1.64	.
atr1_1_1_2			-0.75	.
No. of Observations	3344		3344	

+ p<0.10 * p<0.05 ** p<.01

Table 5.3: Estimated coefficients and p-values from a multi-level model of NREGS workdays in the last 13 months

	Random Intercept Model		Random Slopes Model	
	Coefficient	p-value	Coefficient	p-value
Household level characteristics				
Caste (Ref: SC/ST)				
Upper	-3.07+	0.1	-3.07+	0.1
Muslim	-2.01	0.52	-1.56	0.6
OBC	-0.27	0.8	-0.21	0.85
Other	-2.26	0.34	-2.18	0.36
Land owned in acres	-0.28+	0.05	-0.39*	0.03
Number of non-land assets owned	-0.29	0.37	-0.26	0.41
Highest education in the household (Omitted: Completed class 12 or less)				

Bachelors	0.66	0.55	0.67	0.55
Higher than Bachelors	-1.1	0.54	-1.11	0.53
No. of 16-59yr olds in the household with low education (completed less than class 11)	0.97**	0	0.97**	0
In a stable occupation (Artisans or have a factory, Shop-keeper or running business of some type, Working at an office for a salary)	-1.68	0.18	-1.61	0.19
If at least one household member lives away and sends money home	3.02*	0.03	2.95*	0.04
If at least one household member is or was a Panchayat or a political party member	0.73	0.65	0.67	0.68
If head of household had given advice to villagers or workers on own farm or business	2.63*	0.03	2.60*	0.03
If the household has ever availed of the services of the police station or block office	2.53*	0.02	2.53*	0.02
Village level characteristics				
Distance of the village from nearest town in KM	0.19	0.29	0.24	0.14
Proportion of village whose main occupation is Cultivation or Agricultural Labourer	-8.73	0.27	-9.45	0.2
Average Rainfall in village	0	0.19	0	0.17
Fraction of net sown area irrigated	-2.19	0.69	-0.8	0.88
State (Omitted: Maharashtra)				
Odisha	3.47	0.46	2.92	0.51
NclScore	5.81+	0.09	5.25	0.1
Constant	10.22	0.27	9.5	0.27
No. of Observations	2231		2231	
lns1_1_1	2.02	.	-1.07	.
lnsig_e	2.85	.	2.85	.
lns1_1_2			2.08	.
atr1_1_1_2			-7.75	

+ p<0.10 * p<0.05 ** p<.01

Table 5.4: Estimated coefficients from a model of MGNREGS participation among households in elite villages estimated using LPM

	Model1	Model2	Model3	Model4	Model5
State (Ref: Maharashtra)					
Odisha	-0.15**	-0.15**	-0.14*	-0.15**	-0.15**
Uttar Pradesh	-0.30**	-0.29**	-0.28**	-0.30**	-0.28**
NclScore	0.18*	0.17*	0.18*	0.17*	0.17*
Client status (Ref: Non-client)					
Client	0.08*				
Client status (Ref: non-client)					
Client but not of political elite				0.04	
Client of political elite				0.09*	
Client status (Ref: non-client, not dependant)					
Dependant but not client			0.16**		
Client			0.13**		
Client status (Ref: non-client, Panchayat Pradhan of different caste)					
Non-client, Panchayat Pradhan of same caste					0.03
Client, Panchayat Pradhan of different caste					0.05
Client, Panchayat Pradhan of same caste					0.14+
Number of dependents		0.09**			
No. of Observations	2083	2083	2083	2083	2032
R-squared	0.202	0.221	0.219	0.203	0.201

Robust standard errors
+ p<0.10 * p<0.05 ** p<.01
[#] This sample excludes those households who have a missing value on Panchayat Pradhan caste

Table 5.5: Estimated coefficients from a model of MGNREGS workdays among households in elite villages estimated using OLS

	Model1	Model2	Model3	Model4	Model5
State (Ref: Maharashtra)					
Odisha	8.36*	8.60*	8.50*	8.44*	7.49*
NclScore	11.49*	13.97*	11.65*	12.45**	10.07*
Client status (Ref: Non-client)					
Client	6.34+				
Client status (Ref: non-client)					
Client but not of political elite				15.31+	
Client of political elite				4.63+	
Client status (Ref: non-client, not dependant)					
Dependant but not client			0.72		
Client			6.57+		
Client status (Ref: non-client, Panchayat Pradhan of different caste)					
Non-client, Panchayat Pradhan of same caste					-0.31
Client, Panchayat Pradhan of different caste					3.99
Client, Panchayat Pradhan of same caste					7.26+
Number of dependents		1.35			
No. of Observations	910	910	910	910	879
R-squared	0.115	0.106	0.115	0.122	0.117

Robust standard errors
+ p<0.10 * p<0.05 ** p<.01
[#] This sample excludes those households who have a missing value on Panchayat Pradhan caste

Table 5.6: Estimated coefficients from a model of MGNREGS workdays estimated using TOBIT

	Model 1	Model 2
State (Ref: Maharashtra)		
Odisha	-2.88	-7.18
NclScore	15.13+	20.73
Client status (Ref: Non-client)		
Client	12.72*	0.79
Odisha X NclScore		1.43
Odisha X Client		54.96*
Client X NclScore		2.31
Odisha X Client X NclScore		-58.18**
No. of Observations	910	910
R-squared		
Sigma	37.09**	36.52**

Robust standard errors
+ p<0.10 * p<0.05 ** p<.01

Table 6.1: Estimated coefficients from a model of receiving any of the three one-time benefits (BPL card, Old-age pension, Indira Awas Yojana) among households in elite villages estimated using LPM

	Estimation sample of ever worked for NREGA	Estimation sample of number of days worked for NREGA (in the last 13 months)
State (Ref: Maharashtra)		
Odisha	-0.08	0.04
UP	-0.09	
NclScore	0.02	0.33+
Client status (Ref: Non-client)		
Client	-0.03	-0.03
Number of observations	2083	910
R-squared	0.074	0.079

Table 6.2: Estimated coefficients from a model of NREGS awareness among households in elite villages estimated using LPM

State (Ref: Maharashtra)	
Odisha	0.55*
UP	0.33
NclScore	0.26
Client status (Ref: Non-client)	
Client	-0.03
Number of observations	1505
R-squared	0.256

Table 6.3: Estimated coefficients from models of MGNREGS participation and MGNREGS workdays estimated using 2SLS

	1st stage	2nd stage	1st stage	2nd stage
	Client	MGNREGS participation	Client	MGNREGS workdays
Household level characteristics				
Caste/Religion (caste and religion of head of household) (Ref: SC/ST)				
Upper	-0.01	-0.14+	0.09+	1.14
Muslim	0.04	-0.27**	0.42**	-5.99+
OBC	0.04*	-0.02	0.13**	1.25
Other	-0.01	-0.01	0.01	-0.26
Land owned (Total rural land by the household in acres)	0	0	0.00	-0.83**
Non-land assets index	-0.01	-0.01	-0.02	-0.54
Maximum education in household (maximum level of education among all household members) (Ref: Completed class 12 or less)				
Bachelors	-0.01	-0.08*	-0.03	1.6
Higher than Bachelors	-0.01	-0.15*	0.03	-8.13**
Potential workers (number of household members with education below secondary level and aged between 16 and 60)	0	0.03**	0.00	1.84**
Stable occupation (1 if head of household running a business/factory/production unit and/or salaried position in some organization)	-0.06**	-0.10*	-0.10	-6.32+
Remittance received (1 if if someone living outside the village sends money to the household)	-0.03	-0.01	-0.02	3.92**
Socio-political influence (1 if a member of household is/was panchayat pradhan/ member of local government/ position holder of political party, union)	-0.01	0.01	0.02	-0.39

Advice given (1 if household members mediate in community disputes)	0.01**	0.07*	0.01	4.57
Experience with local services (1 if any household member has experience of dealing with police, court, administration)	0.06	0.07*	0.11+	3.15
Village level characteristics				
Distance to town (distance of the village to the nearest town in kilometres)	0	0	0	-0.75**
Percentage Agriculture (proportion of households in the village whose main occupation is agriculture or working as an agricultural labourer)	0.02	0	0.14	15.53*
Average Rainfall (in the village)	0	-0.00**	0	-0.04**
Irrigation (Proportion of sown area in the village which is irrigated)	0.02	-0.23*	-0.03	-10.77**
State (Ref: Maharashtra)				
Odisha	0.04	-0.15**	-0.02	9.06**
Uttar Pradesh	-0.03	-0.30**		
NclScore	0.36**	0.17*	0.43**	12.77**
Client status (Ref: Non-client)				
Client		0.09		5.36
IVoutlinkLLR=1	0.28**		0.24**	
Constant	-0.08	0.93**	-0.27	56.94**
No. of Observations	2062	2062	904	904
R-squared	0.272	0.200	0.301	0.114

Robust standard errors
+ p<0.10 * p<0.05 ** p<.01

Diagram 2.1: All outgoing link in a village

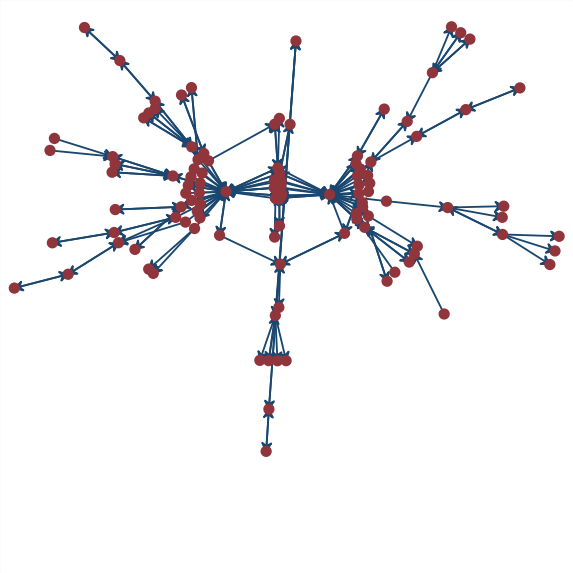
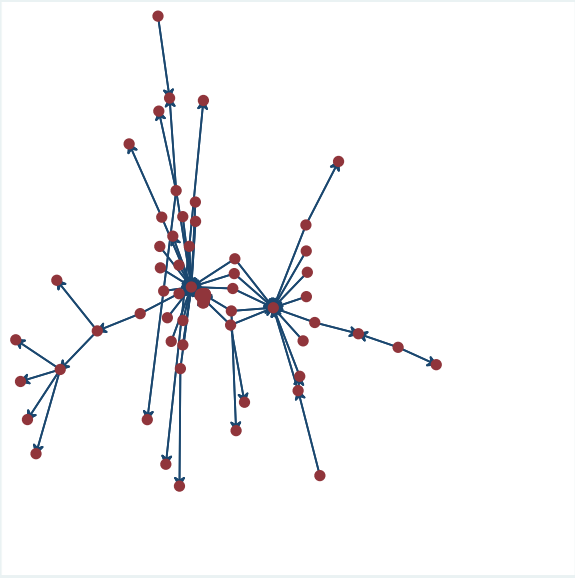


Diagram 2.2: All dependence –connection in two villages
(a) Elite village



(b) Non-elite village

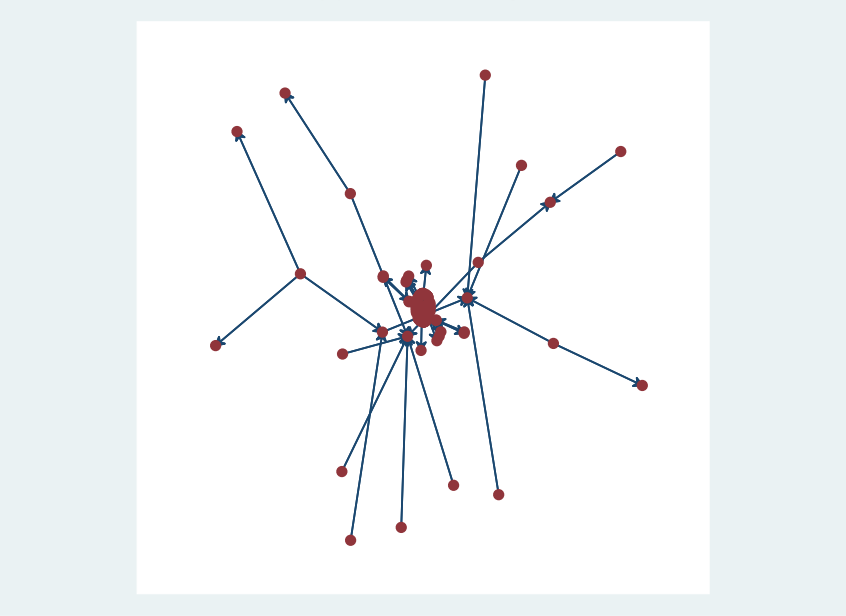
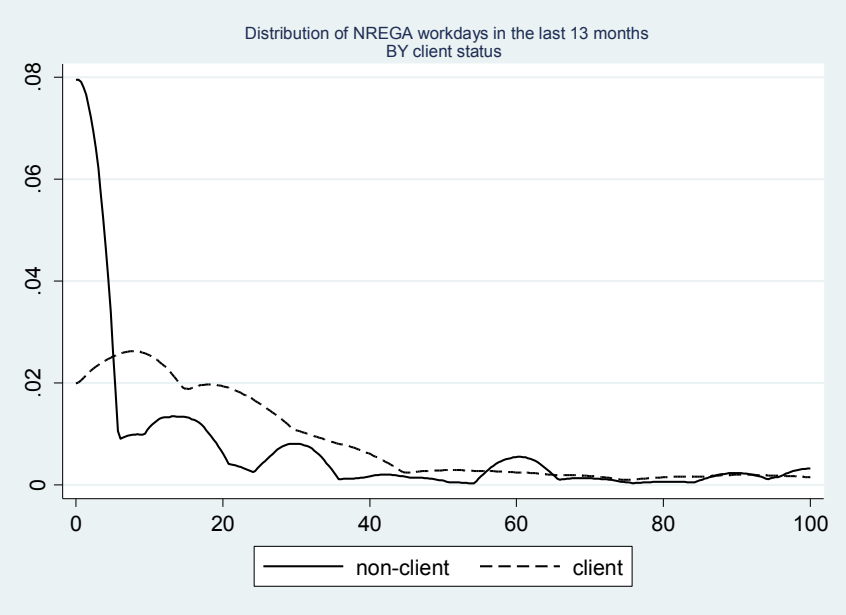


Diagram 3.1: Distribution of MGNREGS workdays in last 13 months prior to the survey by client status



A List of variables

Household-level variables Source: Household questionnaire of our survey		
Variable Name	Description	Definition
wdaysever	Participation in MGNREGS work since its introduction	1: if ever participated 0: otherwise
wdaysnum	Number of MGNREGS workdays in last 13 months prior to the survey	Number of days
caste	Caste and religion of household head	Five categories: • Upper: if Brahmin/ General • Lower: if SC/ST/NT • OBC: if OBC • Muslim: if religion is Muslim • Other: if none of the above
land owned	Total rural land owned by household	In Acre
non-land asset	Index of asset ownership	Sum of following six dummy variables. Each take value 1 if owned by the household and 0 otherwise. • Non-kacha (mud built and thatched roof) house • Flat/house in town • Palang • TV • Two/four wheelers • Tree/ fruit bearing plant
stable occupation	Main household occupation as identified by the household head	1: if running a business/factory/ production unit or salaried position in some organization 0: if any other occupation
remittance received	Remittance from outside the village	1: if someone living outside the village sends money to the household 0: otherwise
potential workers	Number of household members with education below secondary level and age between 16 and 60	Headcount
maximum education in household	Maximum level of education among all the members of a household	Three categories: • Up to higher secondary education • Under-graduation or equivalent degrees • Above under-graduation

socio-political influence	Formal institutional position hold by some household member	1: if a member of household is/was panchayat pradhan/ member of local government/ position holder of political party, union 0: otherwise
advice given	Involvement of household members in mediating community disputes	1: if household members mediate in community disputes 0: otherwise
experience with local administration	Experience of dealing with formal institutions such as police, court	1: if any household member has experience of dealing with police, court, bureaucracy 0: otherwise
Village-level variables Source: Village questionnaire of our survey, if not otherwise mentioned		
Variable Name	Description	Definition
distance to town	Distance to the nearest town	In Kilometer
average rainfall	Average rainfall in the village	Millimeter Source: India Meteorological Department
irrigation	Proportion of sown area of the village which is irrigated	Percentage Source: 2011 Census
percentage labour	Proportion of households in the village for which agriculture or working as agricultural labour is the main occupation	Percentage Source: 2011 Census

B Sample Design

The LIREP survey sample has a multi-stage, clustered and stratified design. The target sample size was 3600 households. As mentioned above, one of the key information that this survey aimed to collect was the local dependence structure and so it was essential to collect information from all or a large percentage of households in each village. So, it was decided to select and interview approximately 100 households from each of the selected villages which meant that 36 villages could be selected in the sample.
India is a vast country with 29 states and union territories and each of these regions are culturally and politically different with many policies being implemented at the regional level. To be able to control for these state level effects it was decided to confine the sample to three states so that we had sufficient sample sizes at the state level. The three states chosen were Orissa, Maharashtra and (the Eastern part) of Uttar Pradesh. These three states or sub-state regions were chosen because of the presence of LWE activity and because across these regions there was sufficient variation in land revenue systems during the colonial period which is famously known to be a factor affecting institutional variations within Indian villages.

Stage 1: Selecting blocks using a stratified design

To increase the variability of the sample along a number of characteristics and to ensure enough sample sizes for one of the key variables of interest, left wing extremism, it was decided to stratify the sample along these characteristics. Most of the information were available at the district or block (a smaller geographical unit than the district) level. So, it was decided to first select blocks from each of the different strata using probability proportion to size (PPS) sampling where size was measured by the number of households in the block (as in 2001 Census of India, the latest that was available to us) and then select a village randomly from the selected blocks again using PPS sampling method where size was measured by the number of households in the village. The characteristics used for stratification for each state sub-sample were as follows:

- Whether the block had experienced left wing extremist activities (L) or not (NL) between the period 2005 to 2010. This was identified using a number of different sources.
- Whether the district containing the block was in coastal (C) or non-coastal region (NC) : identified directly from maps. Coastal regions

were expected to have occupational diversity while people in more interior regions were expected to be mainly in agricultural occupation. To be able to identify different types of dependence, not only predominantly agriculture-based dependence links, the sample was also stratified by coastal and non-coastal region.

- Whether historically the district was under ryotwari or non-ryotwari system during the colonial rule: identified using classification provided by Bannerjee and Iyer ([9]).

These criteria resulted in the population being divided into 12 mutually exclusive and exhaustive 12 strata within the three states with the added constraint that 12 blocks would have to be selected from each region. As some analysis would look at the LWE impact it was also decided that there should be a sufficient number of villages from the LWE stratum. Hence the following stratification strategy was implemented. Ignoring the clustering of households within villages, the deff was computed to be 1.489 and the neff was 2820.

Stage 2: Assigning selected blocks to forest and non-forest sub-samples

The next sampling stage was to select one village from each selected block. In the first sampling stage one of the variables we had stratified by was LWE activity. But as blocks are large areas with on average 170 villages (and 50% of blocks have more than 150 villages but 99% of blocks have less than 550 villages), not all villages are affected by LWE activity. As it was extremely difficult to get precise information on exactly which of the several hundreds of villages in a block has a history of LWE activities, we decided to indirectly screen for LWE affected villages by selecting villages in these LWE affected blocks that were very near to forest as forest cover has been found to be highly correlated with LWE activity at least at the district level and there is anecdotal evidence that LWE organisations mainly base their activities in dense forests as state forces find it difficult to enter these areas. So, we then decided to draw two sub-samples from LWE affected blocks - one from areas next to forests and the other from areas away from forests. We did this by collecting maps of forest cover from the Geological Survey of India and the Forest Research Institute and then overlay those on maps of villages . We decided to assign the following number of blocks to the village sub-sample.

- Strata: Eastern UP- L,NC,NR: As one of the selected blocks in the L,NC,NR strata of Eastern UP had no forested village, this block was

automatically assigned to the non-forested sub-sample and the remaining blocks in those strata since they summed up to the assigned number of blocks for the Forest Sub-Sample, were allocated to the Forest Sub-Sample.

- Strata: Orissa - L,CO,NR: As one of the selected blocks in L, CO, NR strata in Orissa had no forested village, this block was automatically assigned to the non-forested sub-sample and the remaining blocks in those strata since they summed up to the assigned number of blocks for the Forest Sub-Sample, were allocated to the Forest Sub-Sample.

- Strata: Orissa - L,NC,NR: We selected 2 out of the 3 blocks by PPS where size measure was the proportion of households in forested villages in these blocks.

- Strata: Orissa - L,NC,RY: The only selected block from this stratum was automatically assigned to the Forest Sub-Sample.

- Strata: Maharashtra - L,NC,NR: We selected 3 out of the 4 blocks by PPS where size measure was the proportion of households in forested villages in these blocks.

Stage 3: Selecting villages from selected blocks

Finally we selected one village from each of the 36 selected blocks using PPS where size measured by the total number of households in the village.

Stage 4: Selecting households from selected villages

In villages where the total number of households was less than 100 all households were selected. In villages where the total number of households was more than 100 up to 110 households were selected from the selected villages using simple random sampling. The sampling frame used was the most recent electoral roll for those villages. The target was to interview at least 100 households in each village and at most 110 households. In some cases, 100 households could not be found. In such cases additional households were selected from the remaining households in the villages again using simple random sampling to reach the target sample size.

In the final sample, 21 of the sampled villages included less than 50% of the HHs in the villages, 5 included 50-60% of the HHs in the villages, 3 included 60-70% of the HHs in the villages, 2 included 80-95% of the HHs in the villages and 4 were village censuses.