RANDOMIZED IMPACT EVALUATION OF AFGHANISTAN'S NATIONAL SOLIDARITY PROGRAMME – VILLAGE BENEFIT DISTRIBUTION ANALYSIS

PRE-ANALYSIS PLAN: HYPOTHESES, METHODOLOGY, AND SPECIFICATIONS

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I. Introduction

This pre-analysis plan for the Village Benefit Distribution Analysis (VBDA) specifies methodologies and specifications to be employed in testing hypotheses pertaining to the impact of institutional changes generated by the National Solidarity Programme (NSP) and related interventions on local governance outcomes. The plan was written prior to data analysis and pre-commits the authors to defined specifications for estimating impacts.[1]

The plan is structured around four sections, one table, and three appendices. Section II provides an overview of the study, detailing the nature of the treatment and associated interventions, the sample, and the experiment deployed to generate data for the study. Section III lists the hypotheses for the study. Section IV describes the methodology and specifications to be employed in hypothesis testing. Table I lists the hypotheses and indicators for the study. Appendices I – II list questions included in the Village Benefit Distribution Surveys and Appendix III lists questions from the Second Follow-Up Survey that are to be used in the analysis.

II. Description of Dependent and Explanatory Variables and Data Collection

The VBDA is a behavioral experiment designed to identify how externally-imposed institutional changes generated by NSP impact the performance of local leaders in delivering public services. The experiment will also identify impacts of mandating the participation of different groups of local leaders in service delivery.

The experiment generates quantitative measures of leader behavior by organizing and then monitoring village-level distributions of food aid across 500 villages in Afghanistan. The distribution of food aid provided by external agencies is a common public service performed by local leaders in rural Afghanistan. Such distributions present leaders with the option to distribute aid equitably to vulnerable villagers; distribute aid equally among all villagers; or embezzle aid for personal or familial benefit. Data on how leaders distribute food aid are to be collected by surveys administered to random samples of village households and aid recipients following the distribution.

The sections below provide background information on the explanatory variables for the study, on the distributions that generate data for dependent variables for the study; as well as information on the sample and the assignment of treatment across the sample. Sub-section i describes the treatment intervention, NSP; sub-section ii reviews the sample; sub-section iii details the methodology used to

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[1] In the event that the structure of the data or other unforeseen factors necessitate adjustments in the methodology and specifications to be employed in the analysis, such adjustments will be documented with reference to the original specifications in this note and accompanied by a justification of why such adjustments were necessary.

assign treatment; sub-section iv details the mechanics of the benefit distribution and data collection on distribution outcomes; and sub-section v describes an intervention implemented across the treatment and control samples which varied the involvement of different groups in the distribution.

II.i. Treatment Intervention[2]

The National Solidarity Programme (NSP) was conceived following the fall of the Taliban as a means to extend the administrative reach of the state, build representative institutions for local governance, and deliver critical services to the rural population. Since its inauguration in 2003, NSP has been implemented in over 29,000 villages across all 34 provinces of Afghanistan, making it the largest single development program in the country. The program is executed by the Government of Afghanistan, funded by the World Bank and a consortium of bilateral donors, and implemented by 28 NGOs (known as Facilitating Partners).

Program implementation is structured around two major interventions at the village level. The first seeks to build a structure for village governance centered on democratic processes and women's participation through the creation of a gender-balanced Community Development Council (CDC) through a secret-ballot, universal suffrage election. The second intervention aims to improve the access of rural villagers to critical services and infrastructure by disbursing 'block grants' - valued at $200 per household up to a village maximum of $60,000 - to support implementation of village-level projects designed and selected by CDCs in consultation with village community. [3]

II.ii. Sample[4]

The sample for the study comprises a sub-sample (to be selected based on accessibility given local security and weather conditions) of 500 villages spread evenly across ten districts in Balkh, Baghlan, Daykundi, Ghor, Herat, and Nangarhar provinces.[5] The ten districts were selected based on size, security conditions, and the constraint that no villages in the district had previously participated in NSP. In each of these ten districts, NSP Facilitating Partners were asked to select 50 villages which they deemed suitable for NSP implementation,[6] which in turn provided the sample of 500 villages.

Although the 500 sample villages cannot - by virtue of their clustering in only ten of 398 districts and the non-random selection of the ten districts in which they are located - provide a random sample of villages in Afghanistan, the 500 selected villages are representative of Afghanistan's geographic, ethnic, and economic diversity. An assessment of the demographic and economic characteristics of the 500 villages reveal few substantive differences with those of a random sample of villages surveyed by the 2007-08 National Risk and Vulnerability Assessment.[7]

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[2] Additional information on NSP is available at the program website at: http://www.nspafghanistan.org

[3] Among the 250 treatment villages in the evaluation sample, 23 percent of sub-projects are focused on roads and/or bridge construction or resurfacing, 22 percent cover women's vocational training and literacy, 20 percent pertain to drinking water, 15 percent relate to irrigation, and 14 percent focus on electrification.

[4] A full description of the procedure used to select the sample is provided in Section IV.1 of Beath, Christia & Enikolopov (2008)

[5] The sample for the VBDA is, *ex-ante*, identical to the sample for the wider NSP impact evaluation, but due to the fluency of security conditions in rural Afghanistan, not all 500 villages are expected to be able to be surveyed for the VBDA and small discrepancies are anticipated between the villages that are covered by the first follow-up survey, second follow-up survey, and by the VBDA survey.

[6] The number of villages in the ten evaluation districts ranges from 66 to 273

[7] See Section IV.1 of Beath, Christia, Enikolopov & Kabuli (2010)

II.iii. Assignment of Treatment[8]

Of the 500 villages in the sample, 250 were randomly selected to receive NSP. In order to improve statistical balance between villages in the treatment and control groups, a matched-pair cluster randomization procedure was applied in four stages:

1. Village Clusters - To minimize potential for spillovers between treated and untreated units, villages located within one kilometer were grouped in clusters. Across the sample, 107 villages were assigned to 41 village clusters.

2. Matched Pairs - In each district, the 50 sample villages were paired into 25 groups of two using an optimal greedy matching algorithm, which matched villages to ensure similarity based on various background characteristics provided that the villages were not in the same village cluster.[9]

3. Assignment of Treatment - In each matched pair, a random number generator was employed to decide which of the two villages would receive NSP. In order to minimize the probability of spillovers biasing estimated impacts, clusters of villages were assigned the same status.[10]

4. Clustering Violations - In a few districts, the large number of clustered villages precluded the co-assignment of all the villages in the same village cluster to the same treatment status. For cases in which assignment of treatment status without a violation of the clustering restriction was not possible, the number of violations was minimized through a simulation approach.[11]

The procedure implemented using a computer code in September 2007, at which time baseline data had been collected but not processed.

II.iv. Structure of Village Benefit Distribution and Data Collection

The food aid distribution and the associated data collection generate quantitative data on the behavior of village leaders in the performance of a key public service, which serves as the dependent variable for the study. Distribution and data collection activities are implemented during three visits to each village made by distribution agents and enumerators over three, non-consecutive days:

Day 1: A distribution agent, hired and trained by the evaluation team, travels to the village and convenes a short meeting of the village leaders.[12] The agent informs the leaders that the village has been selected to receive a fixed quantity of wheat (approximately one 50 kilogram bag for one sixth of the households in the village) from the World Food Programme (WFP) and that, in three days, WFP will be delivering the wheat to the village.[13] Leaders are

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[8] A full description of the methodology and procedure used to randomly allocate NSP across the sample is provided in Section IV.2 of Beath, Christia & Enikolopov (2008)

[9] Data for the matching consisted of demographic and geographic characteristics of villages obtained from the Household Listing Survey conducted by Afghanistan's Central Statistics Office between 2003 and 2004.

[10] It is important to note that although this feature of the randomization design makes the assignment of treatment status in neighboring villages interrelated, the unconditional probability of being assigned to a particular treatment status remains the same for all the villages, so that the main identifying assumption is not violated.

[11] The clustering restriction was violated in 17 village clusters (covering 44 villages).

[12] As described in the following section, variation is introduced in the composition of the village leaders that are convened.

[13] Due to adverse security and road conditions, direct delivery of wheat to some villages is not permissible. In some districts, all villages are affected, while in other districts, just some villages cannot directly receive wheat. In districts in which all villages are affected, a procedure is to be implemented by which village leaders are requested

informed that the wheat is intended for distribution among vulnerable members of the village community, such as widow-headed households, and are directed to determine which households in the village are to receive the wheat. In accordance with WFP monitoring requirements, leaders are asked to prepare a list of households in the village that will receive wheat, complete with the amount that each household will receive, and informed that the list will be collected by a WFP representative on the day of delivery.

Day 2: Three days later, a different distribution agent returns to the village with the quantity of wheat allocated for distribution in that village, which is transported either by a WFP vehicle or the vehicle of an agency contracted by WFP to conduct the delivery. The agent collects the list of wheat recipients prepared by the village leaders and, after verifying the legibility of the list, authorizes the transfer of the wheat to the village leaders.[14]

Day 3: Ten days after the distribution of wheat, a team of 6 male and 6 female enumerators return to the village to administer household surveys to three groups of villagers:

First Survey: Random sample of households in the village;[15]

Second Survey: Random sample of households that were listed by village leaders to receive wheat;[16]

Third Survey: Random sample of households that First Survey respondents indicated received wheat, but which were not included in the list provided by the village leaders.[17]

Survey questionnaires are administered conterminously to a male and a female respondent in the same household. Questionnaires are administered to 12 First Survey households and 15 total Second and Third Survey households.[18] First, Second, and Third Survey questionnaires are identical and collect basic demographic and socioeconomic data on the characteristics of the respondent's household, as well as information on the distribution and characteristics of recipient households.

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to travel to the district center to retrieve the wheat and then to arrange for the transportation, at the expense of WFP, of the wheat back to their village. In districts in which just some sample villages were inaccessible, wheat is ordinarily delivered to a neighboring village or other nearby location, from which it is transported by the village leaders to the concerned village.

[14] Other than verifying the legibility of the list, neither the distribution agent nor the WFP contractors conduct any checks to determine the characteristics, or even existence, of people on the list. In addition, as it is the responsibility of the village leaders to distribute the wheat to selected recipients, no effort is made to distribute the wheat directly to listed recipients or to any villagers other than the designated village leaders.

[15] Sample households are randomly selected via a 'fixed interval, random walk' procedure. The procedure directs the enumerators assigned to a village to collectively identify a central point in the village from which individual couples of enumerators will 'fan out' across the geographic space of the village. Enumerator couples then walk in separate directions, selecting dwellings for participation in the survey using the 'skip interval' number for the village, which is proportional to the number of dwellings in the village. A complete description of the procedure is provided in the guidelines provided to enumerators, which are available in both English and Dari here: http://www.nsp-ie.org/vbdaguidelines.html

[16] In the event that the number of households listed as recipients is 9 or less, the population of listed recipients is surveyed.

[17] The identification of Third Survey households is done collectively by enumerators using a procedure outlined in the survey guidelines. In the event of complete coincidence between the households listed as wheat recipients by the village leaders and those identified by First Survey respondents, no Third Surveys are administered.

[18] Ordinarily, 9 Second Survey households and 6 Third Survey households are surveyed, although a high degree of overlap between households listed as recipients by village leaders and household identified as recipients by First Survey respondents would reduce the number of Third Survey respondents and increase the number of Second Survey respondents.

II.v. Variation in Involvement of Different Groups in Village Benefit Distribution

The outcome of the distribution may, in part, depend on the involvement of different groups of village leaders - such as the CDC and prominent women in the village - in the selection of beneficiaries. To identify the impact of mandating the involvement of these groups, randomized variation is introduced into the directions given to distribution agents on Day 1 concerning who to invite to the meeting on the upcoming distribution:

- CDC: In half of treatment villages, male and female CDC members are invited to the Day 1 meeting and requested to select recipients and administer the distribution. A male distribution agent addresses male CDC members and a female distribution agent addresses female CDC members. In the other half of treatment villages, a male distribution agent convenes a meeting of 'village leaders', which ordinarily includes the village headman and members of the customary village council, and requests that they select recipients and administer the distribution. Female village leaders are not explicitly requested to participate, but a female distribution agent is available in the event that women do attend.
- Female Village Leaders: In half of control villages, both male village leaders and prominent women in the village are invited to the Day 1 meeting and requested to select recipients and administer the distribution. A male distribution agent addresses male leaders and a female distribution agent addresses the women. In the other half of control villages, women are not explicitly requested to participate, but a female distribution agent is available in the event that some women do attend.

Variation in the treatment sample will be used to identify whether mandating participation of the CDC in the distribution impacts outcomes of interest. Variation in the control sample will similarly be used to identify the impact of mandating the participation of female village leaders.

III. Hypotheses

The analysis is to be structured around a test of five hypotheses, which are grouped into three 'families':

Family A – Quality of Targeting[19]

H1: **Intervention improves the targeting by village leaders of provided benefits to vulnerable populations in the village, as measured by characteristics of benefit recipients**

H2: **Intervention improves the targeting by village leaders of provided benefits to vulnerable populations in the village, as assessed subjectively by villagers**

Family B – Elite Capture

H3: **Intervention reduces embezzlement of benefits by village leaders**

H4: **Intervention reduces nepotism in distribution of benefits by village leaders**

Family C – Decision-Making Process

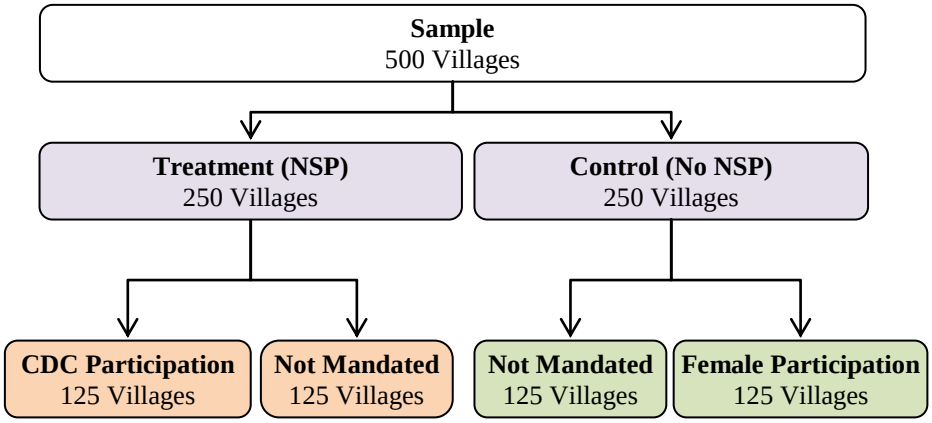
H5: **Intervention results in more participatory decision-making process**

[19] The distinction between targeting as measured by characteristics of recipients (employing a version of proxy means testing) and targeting as assessed subjectively by villagers (employing, among other things, community-based measures of need) is influenced by Alatas et. al. (forthcoming).

The 'intervention' being tested by the hypotheses is to be defined in three different ways: (i) NSP; (ii) mandated participation of CDC in the distribution; and (iii) mandated participation of women in the distribution. Thus, for each hypothesis, three tests will be performed using these three different definitions.

Figure 1 below summarizes the source of variation for the three interventions and the structure of the experiment.

Figure 1: Structure of Variation in Explanatory Variables



Hypotheses are to be tested with respect to NSP by comparing the 250 treatment and control villages; with respect to the mandated participation of the CDC, by comparing the 125 treatment villages in which CDC participation was mandated with 125 treatment villages in which CDC participation was not mandated; and with respect to the mandated participation of women, by comparing the 125 control villages in which female participation was mandated with the 125 control villages in which female participation was not mandated.

The sections below discuss the theory motivating the hypotheses for the three interventions, with Sub-section i discussing NSP; sub-section ii discussing the mandated participation of the CDC; and sub-section iii discussing the mandated participation of women. Further details on each hypothesis, including a list of constituent indicators, are reported in Table 1 below.

III.i. NSP

The main intervention of interest is the assignment of NSP to a village. NSP seeks to build representative local governance structures by creating a CDC through a secret-ballot, universal suffrage election. By strengthening the accountability of the village leadership to all segments of the village population and by broadening the village leadership to include groups previously excluded from decision-making processes, NSP is expected to generate more equitable local governance outcomes. That is, local governance is expected to improve both due to the indirect effect of NSP changing the behavior of pre-existing village leaders and due to the direct effect of NSP changing the composition of the village leadership. Due to these changes, it is hypothesized that NSP will result in improved targeting of benefits to vulnerable populations, reductions in the incidence of embezzlement and nepotism, and an increased use of participatory decision-making processes.

III.ii. Mandated Participation of CDC

Although assignment of NSP to a village increases the probability that the distribution will be managed by the CDC, it does not guarantee it. Specifically, distributions in NSP villages may be

managed by the village headmen who are customarily accorded the responsibility for liaising with entities external to the village. In order to isolate the impact of CDC involvement from the broader effects induced by NSP, the five hypotheses are to be tested with the intervention defined as the mandating of CDC participation.[20] As with NSP, it is anticipated that mandated CDC participation will result in improved targeting of benefits to vulnerable populations, reductions in the incidence of embezzlement and nepotism, and an increased use of participatory decision-making processes.

III.iii. Mandated Participation of Women

An important institutional change induced by NSP is the mandating of women's participation in local governance. In order to isolate the impact of women's involvement from the broader effects induced by NSP, the five hypotheses are tested with the intervention defined as the mandated participation of prominent women in the village in the selection of beneficiaries. By increasing the number of people involved in the selection and thereby providing an additional check on leader behavior, it is anticipated that mandating women's involvement will result in improved targeting of benefits to vulnerable populations, reductions in the incidence of embezzlement and nepotism, and an increased use of participatory decision-making processes.

IV. Methodology

The study seeks to test the above hypotheses and thereby address whether the institutional changes imposed by NSP, as well as variations in institutional rules, alter the behavior of village leaders. Indicators for testing hypotheses are generated using data collected on Day 3 of the wheat distribution and are grouped according to hypothesis. The aggregate effect of the intervention on each of these five indicator groups is estimated, via OLS, as the average of the effects for the constituent indicators, with standard errors estimated using five systems of seemingly unrelated regressions. To ensure robustness to different assumptions concerning unobserved outcomes of the distribution, multiple hypothesis tests are run using different sample adjustments.

The following sections provide a summary of the methodology to be employed in the estimation of intervention impacts. Sub-section i describes the estimation of treatment effects; sub-section ii details the specifications to be employed in hypotheses tests; sub-section iii details the specifications for estimating impacts of variation in treatment and distribution modalities; sub-section iv describes sample adjustments that are to be made to ensure the robustness of the analysis to uncertainty concerning unobserved outcomes of the distribution; and sub-section v covers procedures for addressing cases of missing data or questions with limited variation.

IV.i. Estimation of Treatment Effects

Indicators for the study are to be constructed using variables from household data collected during the First, Second, and Third Surveys on Day 3 of the Village Benefit Distribution and the Second Follow-Up Survey administered prior to the distribution. In some cases, indicators are constructed from the first principal component of respective group of variables.[21] In other cases, variables enter directly as indicators into the regression. Table I below lists these indicators and constituent variables and Appendices I – III list the questions which provide the variables for the study.

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[20] Provided sufficient variation in the identity of village leaders managing the distribution exists within the group of treatment villages in which CDC involvement is not mandated, it should be feasible to estimate the difference in the strength of the 'direct' and 'indirect' effects of NSP on local governance.

[21] Additional details of the indicators for which first principal components will be estimated are provided in Table 1.

For each indicator, the treatment effect is estimated by regressing indicator on a binary variable using the following OLS model:

$$Y_{vi} = \alpha + \tau T_v + \varphi_p + \varepsilon_{vi} \quad (1)$$

where Y_{vi} is the variable outcome for household i in village v;[22] T_v is a treatment dummy for the village; φ_p is the village-pair fixed effect; and ε_{vi} is the error term. Following Bruhn & McKenzie (2009), village-pair fixed effects are included to account for the use of pair-wise village matches in the allocation of treatment.

Standard errors are clustered at the village-cluster level[23] to account for correlation of residuals within village-clusters due to non-independence of assignment.

The main results for the study will report only effects for indicators listed in Table 1, with an appendix reporting effects for all outcomes in the household surveys administered on Day 3.

IV.ii. Estimation of Aggregate Treatment Effects

To examine the overall impact of program on all indicators pertaining to each hypothesis and to account for multiple hypotheses testing, we estimate the overall average treatment effect on all the indicators. The overall average treatment effect is estimated by combining the effects on each of the constituent indicators using the approach in Kling & Liebman (2004).[24]

First, all the K indicators pertaining to a specific hypothesis are standardized by subtracting the mean and dividing by the standard error of the control group. If we denote by $\boldsymbol{Y}_k$ the vector of observations related to outcome k and by Y_k^i its elements, then:

$$\tilde{\boldsymbol{Y}}_k = \frac{\boldsymbol{Y}_k - \frac{1}{n}\sum_i Y_k^i}{Var(Y_k^i | T_v = 0)} \quad (2)$$

Next, all regressions are estimated using these standardized indicators to obtain K standardized treatment effects $\tilde{\tau}_k$, where the regression equation is the same as (1), which in vector form, can be written as:

$$\tilde{\boldsymbol{Y}}_k = \boldsymbol{X\beta} + \boldsymbol{T}\tilde{\tau}_k + \boldsymbol{\varepsilon}_k = \boldsymbol{W\theta}_k + \boldsymbol{\varepsilon}_k \quad (3)$$

The overall coefficient for the hypothesis is the mean of these standardized treatment effects:

$$\tilde{\tau} = \frac{1}{K}\sum_{k=1}^{K} \tilde{\tau}_k \quad (4)$$

The standard error for the overall coefficient is estimated by running a system of seemingly unrelated regressions for the K outcomes and then testing the cross-equation hypothesis that the average of K coefficients equals zero. That is, we estimate the system:

$$\tilde{\boldsymbol{Y}} = (\boldsymbol{I_K} \otimes \mathbf{W})\boldsymbol{\Theta} + \mathbf{E} \quad (5)$$

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[22] Where indicators are constructed at village level rather than household level, the outcome is Y_v rather than Y_{vi}.
[23] See page 3 above for description of village-clusters
[24] This approach is also followed in Casey, Glennerster, and Miguel (2011)

where $\tilde{\boldsymbol{Y}} = \left(\tilde{\boldsymbol{Y}}'_1, \tilde{\boldsymbol{Y}}'_2, \ldots, \tilde{\boldsymbol{Y}}'_K\right)'$, I_K is a k-dimensional identity matrix, $\mathbf{W}$ is vector of independent variables (same for all outcomes) and $\boldsymbol{\Theta}$ is a vector of coefficients which includes $\tilde{\tau}_k$.

From this estimation, using the elements of the variance-covariance matrix that relate to $\tilde{\tau}_k$ elements of $\boldsymbol{\Theta}$, we estimate standard errors for the overall coefficient for the hypothesis as:

$$Var(\tilde{\tau}) = Var\left(\frac{1}{K}\sum_{k=1}^{K}\tilde{\tau}_k\right) = \frac{1}{K^2}\sum_{l=1}^{K}\sum_{k=1}^{K} Cov(\tilde{\tau}_l, \tilde{\tau}_k) \quad (6)$$

IV.iii. Estimation of Effects of Distribution Modalities

As described in Section II above, randomized variation was induced into modalities of benefit distribution across the sample. The following sub-section outlines the specifications that will be employed to estimate the respective effects. Hypotheses tests are conducted according to the procedure described in the previous section.

Distribution Modalities

Variation in distribution modalities enables identification of the impacts of two explanatory variables: (i) mandated involvement of CDC; and (ii) mandated involvement of women. The following regression is employed to estimate these impacts:

$$Y_{vi} = \alpha + \tau T_v + \gamma CDC\_Assigned_v + \delta FVL\_Assigned_v + \varphi_p + \varepsilon_{vi} \quad (7)$$

where $CDC\_Assigned_v$ is a binary variables that equals one if the benefit distribution in village v was assigned to be administered by the CDC and zero if the benefit distribution was assigned to be administered by village leaders; $FVL\_Assigned_c$ is a binary variables that equals one if village v was assigned to have women explicitly invited to participate in the distribution and zero otherwise. All other variables are the same as in equation (2) above, with standard errors clustered at the village cluster level.

A limitation of such a comparison is that it provides a reduced form estimation and depends on the compliance of village leaders, i.e. whether elected council members actually become responsible for the wheat distribution and whether women are involved in the decision making process as requested. We take this limitation into account by estimating the following instrumented variable regression:

$$Y_{vi} = \alpha + \tau T_v + \gamma CDC\_Actual_v + \delta Women\_Actual_v + \varphi_p + \varepsilon_{vi} \quad (8)$$

where CDC_Actual_v and $Women\_Actual_v$ are dummy variables that indicate whether CDC members and women were involved in the decision making process according to the survey respondents, which are instrumented using $CDC\_Assigned_v$ and $FVL\_Assigned_c$. Again, standard errors are clustered at the village cluster level.

IV.iv. Sample Adjustments to Overcome Ambiguity in Identifying Benefit Recipients

A large number of outcomes are dependent on the identification of benefit recipients. However, as the within-village distribution is not observed directly, in some cases ambiguity may exist as to the identity of recipients. Such ambiguity can result from two phenomena: (i) disagreement between

villagers, village leaders, and households identified as recipients by village leaders and/or villagers; (ii) non-distribution of wheat by village leaders prior to Day 3.

The methods used to resolve this ambiguity necessitate the use of different samples in hypothesis testing in order to ensure the robustness of estimates to different assumptions with respect to the identity of wheat recipients. Nine different sample variations will be used to test hypotheses 1 – 4 (three samples whereby villages in which distributions did not occur, and counter-part matched-pairs, are excluded from the sample, and six samples whereby all villages in which data was collected are included), but as hypothesis 5 pertains to the selection process and not the end-result of the distribution, the full sample is employed in all cases. Further information on the sources of ambiguity and associated sample adjustments is provided below.

Disagreement on Identity of Wheat Recipients

As the within-village distribution is not observed directly, there is no definitive means to identify recipients. Using information provided by village leaders and survey respondents, however, it is possible to infer the identity of recipients. There are three sources which are used to make such inferences: (i) lists of recipients prepared by village leaders; (ii) self-reports by male and female survey respondents that their household received wheat; and (iii) recipient households reported by survey respondents. The sets of households within a village suggested by these three sources could conceivably be identical, disjoint, or partially intersecting.

As there is no *a priori* reason to believe that any one of these sources of information is more reliable than the others, three sub-samples of 'recipient' households are constructed using these three sources:

i. Self-Reported Recipients: Households in which either the male or female respondent self-reports that the household received wheat from the recent distribution (regardless of whether the household is designated by village leaders or other respondents as a recipient);

ii. Listed Recipients: Households which are listed as recipients by the village leader(s) (regardless of whether the household self-reports or is designated by other respondents);

iii. Peer-Reported Recipients: Households which other respondents designate as recipients (regardless of whether the household self-reports or is designated by village leaders).

To ensure that the analysis is robust to different assumptions concerning which of these three subsamples is most likely to most accurately represent the actual group of recipients, all hypotheses tests that subsume information on the characteristics of recipients will be conducted repeatedly using the three different samples.

Cases of Non-Distribution

Although the administration of household surveys occur approximately 10 days after delivery of wheat to the village, there exists the possibility that, even after this period, village leaders will not have distributed the wheat among the villagers. This may occur, for example, because the leaders have embezzled the wheat, because they intend to sell it to generate revenue for the provision of a public good (e.g., mosque rehabilitation), or because they wish to await a later event (such as the harvest) before selecting recipients and/or distributing wheat.

In order to ensure that the analysis is sensitive to the ambiguity concerning the identity of end beneficiaries in cases of non-distribution, hypotheses tests that subsume information on the characteristics of wheat recipient will be conducted separately using three different approaches:

i. Exclude Non-Distribution Villages: All villages in which wheat was not distributed are excluded from the sample, along with the counter-part matched pairs of such villages.[25] Accordingly, under this assumption, hypotheses are tested with respect to the three sub-samples of wheat recipients defined above (self-reported recipients, listed recipients, and peer-reported recipients) in villages in which distributions occurred;

ii. Include Non-Distribution Villages, Assume Egalitarian Distribution in Non-Distribution Villages: No villages are excluded from the sample. In villages in which there are no self-reported recipients or peer-reported recipients due to non-distribution, hypotheses are tested with respect to the following two sub-samples of wheat recipients: (i) listed recipients; and (ii) all villagers (or the representative sample of such to which the 1st Survey was administered). Accordingly, given the aforementioned sub-samples for addressing uncertainty concerning the identity of wheat recipients, hypotheses are to be tested with respect to six different sub-samples of wheat recipients: (i) listed recipients in distribution villages and listed recipients in non-distribution villages; (ii) listed recipients in distribution villages and 'all villagers' in non-distribution villages; (iii) self-reported recipients in distribution villages and listed recipients in non-distribution villages; (iv) self-reported recipients in distribution villages and all villagers in non-distribution villages; (v) peer-reported recipients in distribution villages and 'all villagers' in non-distribution villages; (vi) peer-reported recipients in distribution villages and listed recipients in non-distribution villages.

iii. Include Non-Distribution Villages, Use Qualitative Information to Identify Cases of Embezzlement: Enumerators were instructed to note cases where they have reason to believe that village leaders have embezzled non-distributed wheat. This information is to be used to construct a binary variable which assumes a value of one if at least one enumerator or respondent in a village reports that wheat has been embezzled by the village leaders and zero otherwise. Across all nine different sub-samples of wheat recipients mentioned above, hypothesis 3 will be tested with and without this additional indicator. For the six subsamples in (ii) the list of wheat recipients is considered to be empty in villages in which the non-distributed wheat was due to embezzlement.

IV.v. Procedures for Addressing Missing Data and Questions with Limited Variation

The following sections detail the procedures for addressing cases of missing data or of questions with limited variation.

Missing Household-Level Data

No imputation of missing data will be performed. However, checks will be conducted to explore correlation between treatment status and incidents of missing data and between treatment status and the numbers of First, Second, and Third Survey respondents interviewed in each village. The results of these tests will be reported in a statistical appendix and noted in the text.

Attrition of Villages

Some of the 500 villages in the sample may not be able to be surveyed due to non-permissive security conditions, transportation difficulties, or other reasons.[26] In such cases and for all samples,

[25] This is done to preserve balance in the sample and, thus, the internal validity of the experiment.
[26] Note that such attrition is distinct from cases of non-distribution.

the counter-part matched pair of the village will be excluded from the analysis in order to preserve the internal validity of the experiment.

Questions with Limited Variation

In order to limit noise caused by indicators with minimal variation, the power of all indicators listed in Table 1 below will be tested using the control sample and all indicators that do not attain at least 80 percent power in this test will be excluded from the analysis and will not be included in any hypothesis tests.[27] In the event that omission decisions result in the exclusion of all indicators for a hypothesis, the hypothesis will not be tested.

[27] The control (rather than the full) sample is used in order to eliminate what would otherwise be a source of publication bias. Note that the respective control samples differ for each of the three hypotheses.

Table I: Definition of Hypotheses and Indicators

This table details the five hypotheses to be tested and sets of constituent indicators. For each indicator, the number(s) of question(s) used to construct the indicator is listed, along with the method of calculation, if applicable. An 'M' prefix to a question number denotes that the question is from the Male Household Survey, an 'F' prefix denotes Female Household Survey, and a '2FU' pre-prefix denotes the question is from the Second Follow-Up Survey. Appendices I - III lists questions from the surveys. The column (UO) indicates the unit of observation: Household (HH), Respondent (Res), or Village (Vill). The column (Sa.) indicates the sub-sample to be used to estimate the treatment effect: Wheat Recipients (Rec.) or First Survey respondents (1S).

Hypothesis Group	Indicator		Question Number(s) and Method of Calculation	UO	Sa.
Family A: Quality of Targeting					
H1: **Intervention Improves Benefit Targeting, As Measured by Characteristics of Benefit Recipients**	I1: **Household Consumption** - First Principal Component of:	• Per Capita Total Consumption of Non-Durable Items	Logarithm of M2.01 - 2.05, M2.07 - 2.08, M2.12 – 2.14, Divided by F1.06	HH	Rec
		• Per Capita Caloric Intake of Household	Sum of F3.04 for All Food Items, Divided by F1.06	HH	Rec
		• Self-Reported Lack of Deficit in Household Food Intake	First Principal Component of Normalized (7 Minus F3.01) and (12 Minus Months Indicated in 3.02)	HH	Rec
	I2: **Household Assets** – First Principal Component of:	• Stock of Household Assets (including Rooms Occupied)	First Principal Component of Normalized M3.01 - 3.22and (F1.03 Minus F1.05)	HH	Rec
		• Area of Land Owned by Household	Sum of M1.06 - 1.07	HH	Rec
	I3: **Vulnerability Status of Household** – Maximum of:	• Household Headed by Widow	F1.07 (Binary)	HH	Rec
		• Household Headed by Male who is Disabled or Recently Suffered Serious Illness or Injury	F1.08, F2.06 - F2.08 (Binary)	HH	Rec
		• No Male Resident Between the Age of 14 and 60 in Household	F1.07 (Binary)	HH	Rec
	I4: **Omnibus Targeting Indicator**		First Principal Component for I1, I2, I3 Questions plus Additional Indicators: *HH Head has No Formal Education* (M1.02); is *Illiterate* (M6.03); is *Unable to Complete Calculation* (M6.04) and; *HH Borrowed to Meet Food Needs* (M4.01 – 4.02)	HH	Rec
H2: **Intervention Improves Benefit Targeting, As Assessed Subjectively by Villagers**	I1: **For Each Recipient, Proportion of Second Follow-Up Respondents that Ex-Ante Identified the Recipient as Vulnerable**		2FU-M9.07, 2FU-F11.07	HH	Rec
	I2: **Proportion of Recipients Reported Ex-Post to be Vulnerable**		M5.07, F4.07 (Binary)	Res	1S
	I3: **Distribution Perceived to Have Primarily Benefited Vulnerable Households** – First Principal Component of:	• Respondent Reports that All Deserving Households Received Wheat	M5.21, F4.21 (Binary)	Res	1S
		• Respondent Reports that Some Recipients Households are Not Vulnerable	M5.22, F4.22 (Binary)	Res	1S
		• Respondent Reports that Wheat was Distributed Primarily to Vulnerable Households	M5.23, F4.23 (Binary)	Res	1S
		• Fairness of Distribution According to Respondent	Numerical Equivalent (1 – 4) of M5.24, F4.24	Res	1S

Hypothesis Group	Indicator	Question Number(s) and Method of Calculation	UO	Sa.
Family B: Elite Capture				
H3: **Intervention Reduces Embezzlement of Benefits by Village Leaders**	I1: **Respondent Indicates that Some Wheat was Retained by Village Leaders for Personal Use**	M5.18, F4.18 (Binary)	Res	1S
	I2: **Respondent Indicates that Some Wheat was Sold by Village Leaders**	M5.20, F4.20 (Binary)	Res	1S
	I3: **Wheat Revoked by Village Leaders following Distribution**	Maximum of binary equivalent of M5.02 & F4.02 conditional on M5.03 & F4.03 being village leader	Res	Rec
	I4: **Difference between Total Amount of Wheat Received by Respondents and Amount Allocated by Village Leaders' List to those Respondents**	Sum of maximum of M5.01 & F4.01 across households minus sum of amounts allocated to those households by village leaders' lists	Vill	Rec
H4: **Intervention Reduces Nepotism in Distribution of Benefits by Village Leaders**	I1: **Recipient Self-Identifies Household as Related to Village Leader or Member of Village Elders**	Maximum of M1.04 - 1.05, F2.01 - 2.02 (Binary)	HH	Rec
	I2: **Proportion of Recipients Reported to be Close Friends or Relatives of Village Leaders**	M5.06, F4.06	Res	1S
	I3: **Respondent Reports that Wheat was Distributed Primarily to Households Connected to Influential Villagers**	M5.23, F4.23 (Binary)	Res	1S
	I4: **Respondent Reports that Wheat was Distributed to Village Leaders Not Involved in Decision-Making Process**	M5.19, F4.19 (Binary)	Res	1S
Family C: Decision-Making Process				
H5: **Intervention Results in More Participatory Decision-Making Process**	I1: **Respondent Reports that Selection of Recipients was Made by More than One Person**	M5.08, F.4.08 (Binary)	Res	1S
	I2: **Respondent Reports that Ordinary Villagers Either Selected Recipients or Were Consulted**	M5.10 - 5.11, F4.10 - 4.11 (Binary)	Res	1S
	I3: **Total Number of People Involved in Selection or Consultations**	M5.12, F4.12	Res	1S
	I4: **Respondent was Involved in Selection or Consultations**	M5.13, F4.13 (Binary)	Res	1S
	I5: **Women were Involved in Selection**	M5.14, F4.14 (Binary)	Res	1S
	I6: **There were No Conflicts Related to Distribution**	M5.17, F4.17 (Binary)	Res	1S
	I7: **Identity of Recipients was Publicly Announced by Village Leaders**	M5.16, F4.16 (Binary)	Res	1S

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Appendix I: List of Questions in Male Household Village Benefit Distribution Survey

#	Question	Hypothesis
1.01	How old are you?	-
1.02	How many years of school, madrassas or mosque school have you completed?	H1
1.03	During the past 12 months, what type of work brought the most amount of income or food to the household?	-
1.04	Do you or a member of your household serve as elders of the village?	-
1.05	Are you a relative of the {malik / arbab / qariyadar} [IF YES] What is the relationship?	H4
1.06	How many jireebs of irrigated land does your household own?	H1
1.07	How many jireebs of rainfed land does your household own?	H1
-	During the past 30 days, how much money have you and your household spent on the following items:	-
2.01	Food?	H1
2.02	Fares for Bus, Taxis and Other Transportation Costs?	H1
2.03	Phone Credit and Communication Costs?	H1
2.04	Fuel for Car, Motorcycle, or Other Vehicles?	H1
-	During the past 12 months, how much have you and your household spent of the following items:	-
2.05	Clothing and Shoes?	H1
2.06	Constructing or Repair of the House?	H1
2.07	Medicine & Doctors and Hospital Fees or Other Methods of Medical Treatment?	H1
2.08	Fees for Training or School?	H1
2.09	Engagement and Wedding Expenses and Bride Price	H1
2.10	Funeral and Related Costs?	H1
2.11	Hajj Costs?	-
2.12	Traditional Festivals (Eid and Nawroz)?	-
2.13	Charity and Relief?	H1
2.14	Zakat?	H1
-	How many types of these animals do you have:	-
3.01	Oxen?	H1
3.02	Cow?	H1
3.03	Horse?	H1
3.04	Donkey?	H1
3.05	Goat and Kids?	H1
3.06	Sheeps and Lambs?	H1
3.07	Chicken and Poultry?	H1
3.08	Any Other Animals?	H1
-	Do you or your household have these items:	-
3.09	Carpet?	H1
3.10	Afghan Hand-Made Carpet, Strip Cotton Carpet, Thick Woolen Carpet, or Carpet?	H1
3.11	Radio?	H1
3.12	Mobile Phone?	H1
3.13	Television?	H1
3.14	Dish or Satellite?	H1
3.15	Carpet-Weaving Hoop?	H1
3.16	Wheelbarrow?	H1
3.17	Bicycle?	H1

3.18	Motorcycle or Three-Wheeler?	H1
3.19	Waterpump?	H1
3.20	Tractor?	H1
3.21	Plow?	H1
3.22	Car?	H1
4.01	During the past 12 months, did you or your household borrow money or food?	H1
4.02	For what purpose did you need the loan?	H1
4.03	Compared to this time last year, do you think that the economic situation of your household has improved, stayed the same, or deteriorated?	-
4.04	In your opinion, will the economic welfare of people in this village improve in the next year?	-
5.01	Other people whom we have interviewed in this village have mentioned that wheat was distributed to households in this village last week. How much wheat did your household receive in this distribution?	H3
5.02	Did you keep all of the wheat that was distributed to you or was some or all of it taken back by someone from you? [IF YES] How much was taken back?	H3
5.03	Who took the wheat back?	H3
5.04	Approximately, how many {other} households in the village received wheat?	-
5.05a	Which were the households that received wheat? Please tell me the name and father's name of the head of each household.	-
5.05b	Which are the ten households that received the most wheat? [IF MORE THAN TEN HOUSEHOLDS RECEIVED WHEAT AND ALL HOUSEHOLDS RECEIVED AN EQUAL AMOUNT] Which are the ten households which received wheat and you know the best?	-
5.06	Is this household close family or close friends of the main decision-makers of the village?	H4
5.07	Is this household needy?	H2
5.08	How was the decision about which households received the wheat made? Was it primarily made by one person or was it made by more than one person?	H5
5.09	Who is the person who made this decision? (What is his title or position?)	-
5.10	Who are the people who made this decision? (What are the titles or positions of these people?)	H5
5.11	Were any other people consulted in the decision-making process? [IF YES] Who were these people?	H5
5.12	How many people were involved, either directly or through consultation, in deciding which households would receive wheat?	H5
5.13	Were you involved in the decision?	H5
5.14	Were any women involved in the decision? [IF YES] How many?	H5
5.15	Do these women have any title or position? [IF YES] What?	-
5.16	Did the decision-makers announce which households received wheat and how much each received?	H5
5.17	Was there any fighting or conflict related to wheat distribution? [IF YES] What happened? [WRITE DESCRIPTION]	H5
5.18	Did the decision-makers keep any of the wheat for themselves or their household, rather than distributing it to the villagers? [IF YES] How much, in total, did they keep for themselves?	H3
5.19	Were there any important people who received wheat, but did not participate in the decision? [IF YES] Who were these people and how much did they receive (in total)?	H4
5.20	Was any of the wheat sold rather than distributed to the villagers? [IF YES] How much was sold?	H3
5.21	Are there any needy households in this village who should have received wheat in the distribution a few days ago, but did not? [IF YES] Why were they not selected to receive wheat?	H2
5.22	Are there households that received wheat in the distribution, but should not have received it? [IF YES] Why were they selected?	H2
5.23	In summary, would you say that the wheat was distributed mainly to needy households in the village, mainly to those households which have a connection to the influential people in the village, or was it evenly distributed to every household in the village?	H2 H4

5.24	In your opinion, was the distribution very fair, somewhat fair, somewhat unfair, or very unfair?	H2
5.25	Before the wheat distribution last week, how many wheat distributions occurred in the past year in this village?	-
6.01	In your opinion, in whose benefit do the decision-makers in the village act: their own, people with power, or for all the people in the village?	-
6.02	Please tell us how happy you are with your life? Very happy, happy, neither happy nor discontent, discontent, very displeased	-
6.03	Can you read this message for me?	H1
6.04	Now, I want you to calculate this for me: What is 7 times 8?	H1

Appendix II: List of Questions in Female Household Village Benefit Distribution Survey

#	Question	Hypothesis
1.01	In which work or occupation do you spend most of your time?	-
1.02	How many years of school, madrassas or mosque school have you completed?	-
1.03	How many rooms are there in this dwelling?	H1
1.04	Are any rooms in this dwelling shared with other households?	H1
1.05	How many rooms are occupied by the other family?	H1
1.06	In total, how many people currently live in this household?	H1
1.07	For each person that is currently living in this household (including you), please tell me their name, age, gender, and relationship to the household head.	H1
1.08	Are any members of the household disabled? [IF YES] Which members of the household are disabled?	H1
2.01	Does any member of this household serve as elders of the village?	H4
2.02	Is any member of this household a relative of the {malik / arbab / qariyadar} [IF YES] What is the relationship between the household member and the {malik / arbab / qariyadar}?	H4
2.03	Does this household currently use electricity?	-
2.04	In the past 30 days, on how many days did your household use electricity?	-
2.05	In the past week, for how many hours out of every 24 hour day did your household have electricity?	-
2.06	In the past 30 days, have you or any member of your household suffered an illness or injury?	H1
2.07	What was the age and gender of the (most recently) ill or injured person?	H1
2.08	What was the (most recent) illness or injury?	H1
2.09	Have there been any bereavements in the household during the past 3 months?	-
3.01	During the past 7 days, for how many days did members of your household go hungry?	H1
3.02	During the last 12 months, in which months did your household face a shortage of food to eat?	H1
3.03	How many days did you eat this item in the past 7 days?	-
3.04	What was the total amount consumed in the last 7 days in kilograms (liters)?	H1
4.01	Other people whom we have interviewed in this village have mentioned that wheat was distributed to households in this village last week. How much wheat did your household receive in this distribution?	H3
4.02	Did you keep all of the wheat that was distributed to you or was some or all of it taken back by someone from you? [IF YES] How much was taken back?	H3
4.03	Who took the wheat back?	H3
4.04	Approximately, how many {other} households in the village received wheat?	-
4.05a	Which were the households that received wheat? Please tell me the name and father's name of the head of each household.	-
4.05b	Which are the ten households that received the most wheat? [IF MORE THAN TEN HOUSEHOLDS RECEIVED WHEAT AND ALL HOUSEHOLDS RECEIVED AN EQUAL AMOUNT] Which are the ten households which received wheat and you know the best?	-
4.06	Is this household close family or close friends of the main decision-makers of the village?	H4
4.07	Is this household needy?	H2
4.08	How was the decision about which households received the wheat made? Was it primarily made by one person or was it made by more than one person?	H5
4.09	Who is the person who made this decision? (What is his title or position?)	-
4.10	Who are the people who made this decision? (What are the titles or positions of these people?)	H5
4.11	Were any other people consulted in the decision-making process? [IF YES] Who were these people?	H5
4.12	How many people were involved, either directly or through consultation, in deciding which households would receive wheat?	H5
4.13	Were you involved in the decision?	-

4.14	Were any women involved in the decision? [IF YES] How many?	H5
4.15	Do these women have any title or position? [IF YES] What?	-
4.16	Did the decision-makers announce which households received wheat and how much each received?	H5
4.17	Was there any fighting or conflict related to wheat distribution? [IF YES] What happened? [WRITE DESCRIPTION]	H5
4.18	Did the decision-makers keep any of the wheat for themselves or their household, rather than distributing it to the villagers? [IF YES] How much, in total, did they keep for themselves?	H3
4.19	Were there any important people who received wheat, but did not participate in the decision? [IF YES] Who were these people and how much did they receive (in total)?	H4
4.20	Was any of the wheat sold rather than distributed to the villagers? [IF YES] How much was sold?	H3
4.21	Are there any needy households in this village who should have received wheat in the distribution a few days ago, but did not? [IF YES] Why were they not selected to receive wheat?	H2
4.22	Are there households that received wheat in the distribution, but should not have received it? [IF YES] Why were they selected?	H2
4.23	In summary, would you say that the wheat was distributed mainly to needy households in the village, mainly to those households which have a connection to the influential people in the village, or was it evenly distributed to every household in the village?	H2 H4
4.24	In your opinion, was the distribution very fair, somewhat fair, somewhat unfair, or very unfair?	H2
4.25	Before the wheat distribution last week, how many wheat distributions occurred in the past year in this village?	-
5.01	In your opinion, in whose benefit do the decision-makers in the village act: their own, people with power, or for all the people in the village?	-
5.02	Compared to this time last year, do you think that the economic situation of your household has improved, stayed the same, or deteriorated?	-
5.03	In your opinion, will the economic welfare of people in this village improve in the next year?	-
5.04	Please tell us how happy you are with your life? Very happy, happy, neither happy nor discontent, discontent, very displeased	-
5.05	Can you read this message for me?	-
5.06	Now, I want you to calculate this for me: What is 7 times 8?	-

Appendix III: List of Relevant Questions in Second Follow-Up Survey

Male Questionnaire

#	Question	Hypothesis
9.07	Who are the five neediest households in the village not related to your household? Please tell me the name, father's name, age, and occupation of the household head.	H2

Female Questionnaire

#	Question	Hypothesis
11.07	Who are the five neediest households in the village not related to your household? Please tell me the name, father's name, age, and occupation of the household head.	H2