RANDOMIZED IMPACT EVALUATION OF AFGHANISTAN'S NATIONAL SOLIDARITY PROGRAMME (NSP)

HYPOTHESES & METHODOLOGY[§]

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I. Introduction

Research in social science has long stressed the importance of institutional quality to economic, social, and political outcomes.[1] Much less is known, however, about the impacts of attempts to promote institutional change through altering *de jure* structures for governance.[2] In this paper, we outline an on-going research program designed to yield inference over the impact of institutional change on local governance structures, political behavior, institutional outputs, and economic outcomes.

The study focuses on a randomized evaluation of Afghanistan's National Solidarity Programme (NSP), a multi-donor community-driven development (CDD) initiative which creates directly-elected Community Development Councils (CDCs), and disburses grants for development projects proposed by CDCs. The governance structures prescribed by the NSP-II are well-defined and, in many cases, represent a profound break from customary governance structures, thereby providing a rare opportunity to rigorously estimate the economic, social, and political impacts of an externally-imposed institutional change.

In addition to estimating the impact of institutional reforms introduced by the NSP program, the study also examines the effect of variation in the method of CDC election and in the procedure used to select projects for NSP funding. In the election-oriented 'sub-treatment intervention', a "ward" election procedure, by which each part of a village elects a dedicated male and female representative,

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[1] Influential studies include (North, 1981), (Sokoloff & Engerman, 2000), and (Acemoglu, Johnson, & Robinson, 2001). See (Hoff, 2003) for an excellent summary of the literature.

[2] (Acemogulu & Robinson, 2006) distinguish between *de jure* political power, allocated by political institutions, and *de facto* political power, "possessed by groups as a result of their wealth, weapons or ability to solve the collective action problem." (p. 2). The distinction is crucial, as *de jure* institutional reforms may have a negligible impact on *de facto* institutional quality, thereby limiting the actual impact of the attempted change on outcomes of interest or, worse, may actually undermine existing institutional structures, leading to economic, social, and political developments quite apart from the outcomes desired by those who designed the reforms (Snyder, 2000).

is compared to an "at-large" election, by which the highest vote-getters across the village are elected to the CDC. In the project selection sub-treatment intervention, a "consultation meeting", by which projects are selected by CDC members following a meeting of the community, is compared to a "referendum", which allows villagers to select projects directly.

This paper provides a description of the treatment and sub-treatment interventions under analysis, the hypotheses to be evaluated, the methodology by which the hypotheses will be evaluated, and the process through which data will be collected and is organized into five sections. Section II presents important background information; Section III presents the working hypotheses of the study; Section IV discusses the research design; and Section V concludes.

II. Background

The following sections provide background information to the research project, detailing the treatment (II.1 – National Solidarity Programme [NSP]), programmatic variation introduced in the treatment villages (II.2 – Sub Treatment Interventions [STIs]), and the existing structures for local governance in rural Afghanistan. Section II.4 concludes by providing a broad overview of the study.

II.1. National Solidarity Programme (NSP)

Inspired by the success of community-driven development (CDD) programs in other post-conflict environments, NSP was launched in June 2003 to build representative institutions for local governance and to alleviate poverty through improving access of rural villages to infrastructure and training.[3] In participating villages, NSP mandates the creation of a Community Development Council (CDC) through a secret-ballot election, which is then accorded responsibility for proposing localized projects to the NSP office. Provided the proposals meet basic guidelines, NSP disburses block grants - up to a combined value of $200 per household and a community maximum of $60,000 – for project implementation.[4]

Financing for NSP is provided by World Bank grants, the Afghanistan Reconstruction Trust Fund (ARTF), the Japanese Social Development Fund, and a variety of bilateral donors. The program is executed by Afghanistan's Ministry of Rural Rehabilitation and Development (MRRD), while program implementation in participating communities is undertaken by 26 international and domestic NGOs, known as Facilitating Partners (FPs). FPs are awarded contracts to 'mobilize' communities in districts, which are assigned to FPs through competitive bidding.

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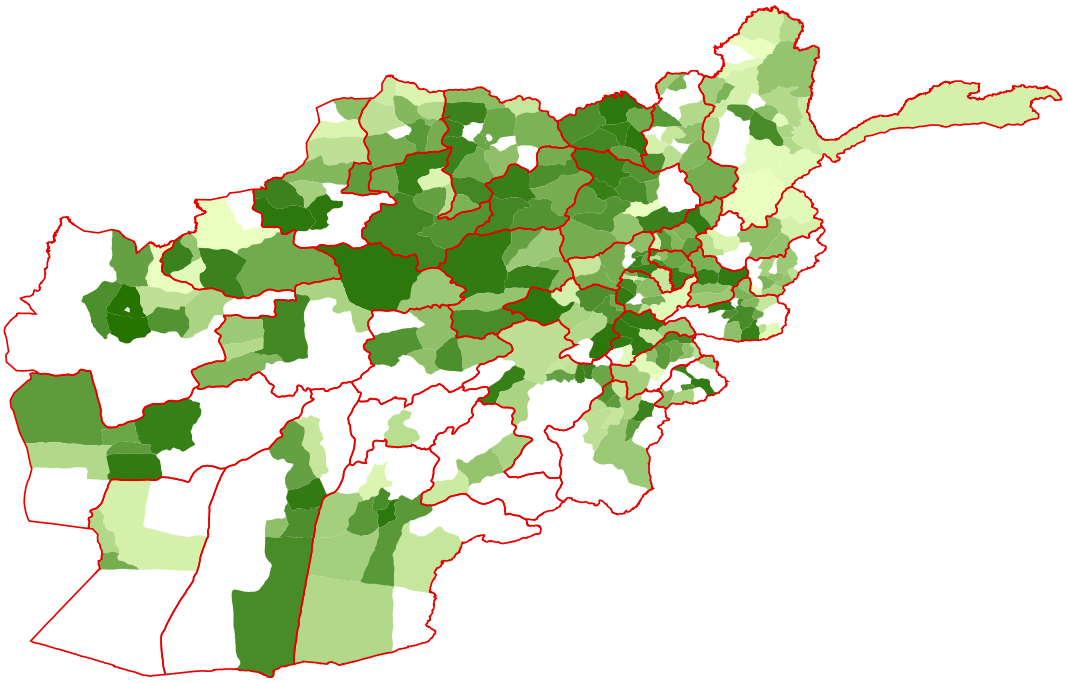
[3] (Chandran, Esteves, Fall, Fan, Ladd, & Sun, 2006; National Solidarity Programme, 2006). The NSP is known in Dari as *Hanbastagi Milli* and in Pashtu as *Milli Pawastoon* and was preceded by a smaller program implemented by UN-HABITAT between 1995 and 2001 which facilitated the formation of urban "community forums" that initiated "small-scale self-initiative projects that addressed urgent urban community infrastructure maintenance and protection needs" (Affolter, Noori, Sawayz, & Shrestha, 2006). For background on CDD programs and an evaluation of their effectiveness as a vehicle for delivering development assistance, see (World Bank Operations Evaluation Department, 2005).

[4] In order to be eligible for participation, villages must contain at least 25 families, although villages with less than 25 families may opt to participate in NSP in cooperation with neighboring villages, provided that the total number of families is 25 or more. In this case, the combined villages will elect a single CDC (National Solidarity Programme, 2006).

Figure 1: Volume of Block Grant Disbursements by District – December 31, 2007



Source: Authors' calculations

NSP implementation in participating communities is generally structured around a project cycle comprising five phases, with a collective duration of between two and three years:

- **Phase I**: FP assigned to the district contacts selected villages to provide information about the policies and procedures of NSP. Leaders in participating villages are asked to consent to the implementation of NSP in their village;
- **Phase II**: FP facilitates secret-ballot, universal-suffrage election to establish the Community Development Council (CDC). These elections, and the registration process which proceeds them, must be conducted free of electioneering and campaigning.[5] Following the election, a CDC president, deputy president, secretary, and treasurer are elected by CDC;
- **Phase III**: CDC consults with members of the community to compile a list of priority projects in a Community Development Plan (CDP), a number of which are selected by the CDC to submit to NSP for funding.[6] FPs are expected to provide

[5] The intent of this is to prevent the elections from fomenting division or "division or elitist usurpation of election results" (Affolter, Noori, Sawayz, & Shrestha, 2006). According to the NSP Operational Manual, "[p]rohibition of candidature and electioneering is critical to reduce the likelihood of elite capture and intimidation" (Affolter, Noori, Sawayz, & Shrestha, 2006).

[6] Project proposals which are eligible for funding under the NSP span the following areas: transportation infrastructure (roads, bridges, culverts), irrigation infrastructure (canals, small check dams), water supply and sanitation (drinking water wells, standpipes), power (micro-hydropower, solar panels, diesel generators), public buildings (schools, health clinics, public baths), training (vocational education, literacy). Subproject proposals are

technical assistance where necessary to help CDCs prepare the CDP, develop project proposals, and to help CDC members develop skills in accounting, procurement, contract management;[7]

- **Phase IV**: Upon approval, block grants are disbursed to villages to cover the purchase of materials and services. CDC undertakes project implementation and reports to the community on progress and use of funds, with FPs and NSP staff monitoring the project completion process;
- **Phase V**: Program partners assess the technical quality of completed projects and document lessons learned.

Districts have been prioritized for participation by the MRRD on the basis of vulnerability factors such as poverty levels, drought risk, or security food supply, the number of returnees or internally displaced persons, and security conditions. The order by which villages within districts are mobilized has, in many cases, been determined by district authorities and FPs.[8] Some FPs may opt to target villages they view as particularly vulnerable, while others may prefer villages proximate to their existing capacity or with whom they have collaborated in the implementation of other development programs. District authorities may have similar priorities, or may dictate that villages of particular political salience be mobilized.[9] Consequently, the selection of villages for participation in NSP has occurred in a somewhat haphazard fashion, with no consistent or quantifiable set of factors determining the pattern of mobilization.

Table 1: Projects Financed by NSP by Sector - January 20, 2008

Agriculture	**20**	**0%**	**Power**	**4,972**	**15%**
Education	4,312	13%	Public Buildings	22	0%
Emergency Response	10	0%	Rural Development	610	2%
Health	85	0%	Transport	7,146	22%
Irrigation	5,179	16%	Water Supply and Sanitation	7,873	24%
Livelihood	2,154	7%			

Source: (Islamic Republic of Afghanistan: Ministry of Rural Rehabilitation and Development (MRRD), 2008)

On March 31, 2007, the first phase of NSP concluded, at which stage 17,200 villages in 279 of Afghanistan's 398 districts had participated in the program, at a total cost of $441 million. There is no precise estimate of the total number of villages in Afghanistan, but the NSP office has expressed its intention to mobilize an additional 17,450 villages. Presently, phase two of NSP is proceeding with an interim goal of mobilizing 4,300 new villages over the course of 2 years. 2,000 of these are

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approved provided they are on the list of eligible sub-projects, are proposed by a CDC and endorsed through a community-wide consultation process, provide equitable access, are technically and financially sound, include an operation and maintenance plan, are funded by the community up to a level exceeding 10 percent of the total cost, and are supported by a commitment to transparency by the CDC (National Solidarity Programme, 2006).

[7] (Kakar, 2005)

[8] Conclusion is based on interviews with FPs conducted by the first author in Kabul during September 2006.

[9] (Kakar, 2005) reports one instance of a district governor who selected communities based on the location of powerful commanders. Problems later arose when commanders rejected the terms of NSP, leading to the withdrawal of the FP. The district governor then accused the FP of not cooperating, raising problems for the implementation of the NSP in that district.

located in 'on-going' districts (which contain villages previously mobilized) and 2,300 are located in 74 'new' districts (which do not contain any villages mobilized by NSP). Due to funding limitations facing the NSP program, the number of villages to be mobilized in 'new' districts is capped at 40.

Table 2: NSP Output Indicators - January 20, 2008

Number of Provinces	**34**
Number of Districts	346
Number of Communities Contracted to FPs	22,323
Number of Communities Mobilized	21,043
Number of CDCs Elected	19,745
Number of CDPs Completed	19,293
Number of Project Proposals Submitted	35,979
Number of Projects Completed	17,042

Source: (Islamic Republic of Afghanistan: Ministry of Rural Rehabilitation and Development (MRRD), 2008)

II.2. Sub-Treatment Interventions (STIs)

Two of the most important means by which villagers participate in NSP is through the election of the CDC and the selection of projects for NSP funding. CDC elections are generally organized according to a "ward" structure, by which villages are divided into wards of between 5 and 25 families. Each ward then elects a male and female representative to the CDC, which represent and report back to their assigned ward. For the project selection procedure, some form of village-wide consultation is required, but there is wide variance in the means by which villagers' preferences are incorporated into the selection process. Procedures for project selection thereby run the gamut from formal referenda to much more limited forms of consultation.

In villages chosen for inclusion in this study, randomized variation in the method of CDC election and in the procedure for project selection was introduced. The election method sub-treatment intervention, referred to as STI-1, seeks to compare the impact of *status quo* ward elections with an at-large election procedure, while the project selection procedure sub-treatment intervention, or STI-2, seeks to compare the impact of consultation meetings with formal referenda. Both of the sub-treatment interventions were developed in close coordination with FPs implementing the NSP program and to a large extent reflect variations either trialled or suggested by them.[10]

The two STIs were independently and randomly assigned across treatment units in the sample. As a result, it can be assured that any differences in outcomes between the respective assignment groups are due to the election methods or project selection procedures implemented, and not due to variance in pre-existing conditions. It is hoped that, if one election method or project selection procedure is found to be relatively desirable, NSP and other CDD and local governance programs can incorporate this knowledge into future revisions of operational procedures.

[10] For each STI, a detailed set of implementation guidelines were prepared by the evaluation team, translated into Dari and Pashto, and provided to the FPs participating in the study. The Dari, English, and Pashto versions of the guidelines are available at: http://www.beath.org/NSP-IE

STI-1: CDC Election Method

STI-1 introduces randomized variation in the method by which the CDC is elected. Half of the treatment villages in the sample are assigned a ward election, which reflects the *status quo* CDC election method, with the other half elect the CDC by an at-large election, which is an innovation designed in consultation with FPs.[11] The basic difference between the two methods is that, in a ward election, the vote choice of villagers are restricted to those 'candidates' who live in their part of the village, or ward.[12] In an at-large election, on the other hand, villagers are free to vote for any 'candidate', regardless of where they live in the village. In addition, voters in a ward election have only one vote, whereas voters in at-large elections are given three votes.[13] Under both election methods, the same procedures are used to determine the number of 'candidates' elected to the CDC, which should contain an equal number of men and women.[14]

Both of the two election methods have potential advantages and disadvantages. Ward elections are considered to be an effective means of ensuring representation for each part of the village and in providing for a clear structure of accountability and reporting between CDC members and the electorate. However, ward elections potentially restrict villagers from electing their preferred set of 'candidates' to the CDC. Thus, if the most educated, experienced, or competent people live in one part of the village, ward elections will preclude their election to the CDC. In addition, the representative relationship created by ward elections encourages CDC members to favor projects which benefit their ward over projects which benefit the whole village. The at-large election method avoid these two pitfalls, but may not be effective in ensuring all parts of the village are represented on the CDC and may also complicate the reporting relationship between the CDC and villagers.

STI-2: Project Selection Procedure

STI-2 introduces randomized variation in the process by which projects in the Community Development Plan (CDP) are selected to be proposed to NSP for financing. Half of the treatment villages select projects through a formal, secret-ballot referendum, the results of which determine the

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[11] Under both procedures, every resident of the village, whether male and female, aged eighteen years or older who has lived for at least one year in the community can be elected to a 3 year term as a CDC member. At least 60% of eligible voters must vote for the election to be valid.

[12] Under the NSP program, candidacy for CDC elections is strictly prohibited. That is, villagers interested in being elected to the CDC should not campaign in any way for the position. The use of the word 'candidate' here is not meant to imply that any vote-getters in CDC elections engaged in such activities.

[13] Three votes were assigned to voters in at-large elections in order to limit the probability of an insufficient number of candidates being elected to the CDC and thereby requiring multiple rounds of voting, something that would prove costly and complicated for FPs to organize. The three votes are not ranked in any way, although community members may opt not to use all of their votes.

[14] Under both election methods, the FP is required to first segment the village into geographically-contiguous wards of between 5 and 25 families. FPs are requested to prepare a map of the community with the districts and enclosed dwellings clearly displayed, with each district being assigned an individual number and display the map in a public area in the village, so that each community member has an opportunity to examine the map and determine which district they belong to. The number of members to be elected to the CDC is then to proportional to the number of wards, with each ward having both a male and female representative. Thus, even in "at-large" elections, it is expected that wards will be created and will each have a dedicated male and female representative. A detailed description of the procedures for ward and "at-large" elections is provided in the *STI-1 Guide for Social Organizers*.

projects to be submitted to NSP for funding.[15] In the other half of treatment villages, the CDC is required to convene and moderate a meeting of villagers to discuss project selection, with the goal of reaching a consensus as to which project(s) should receive funding. In contrast to the referendum procedure, however, the final decision is left to the members of the CDC.

As with STI-1, both project selection procedures have potential advantages and disadvantages. The key advantage of the referendum is that it is directly democratic: each villager is given an equal and unimpeded opportunity to express his or her preference as to which project should be selected. However, there are practical reasons why this may not be an optimal selection procedure. A consultation-based procedure, for instance, permits knowledgeable or experienced villagers to share their expertise and, if seated on the CDC, to exercise that expertise in making a final decision. Given that the success of projects may be related to specific factors of which the general village population may not be knowledgeable, it is conceivable thus that leaving the final decision to the CDC may result in the selection of more appropriate, and ultimately more successful, projects. On the other hand, the consultation meeting procedure enables members of the CDC to select projects that serve their interests over projects that serve the interests of the general village community.

II.3. Structures of Local Governance in Rural Afghanistan

Afghanistan's numerous past conflicts and frequent regime changes have endowed the country with diverse and overlapping structures of rural governance. Prior to 1973, traditional power structures governed rural villages with scant interference from a weak central government.[16] However, since then, numerous attempts have been made by the state to extend power and ideology from Kabul deep into the provinces, each bestowing their own legacy on rural governance.[17]

Traditionally, *Malik* or *Arbabs* ('village headmen') have served as the main interlocutor between village and government. *Maliks* and *Arbabs* are generally wealthy landowners and, owing to their status, may also be called upon to solve community problems.[18] Where land is distributed particularly unequally, large landowners (known as *Khan* or *Zamindar*) may also possess significant *de facto* power on account of their economic wealth.[19] In villages where water resources are of particular economic significance, a *Mirab* is appointed to manage the local water supply and irrigation systems. Reflecting the role of Islam, religious leaders (known as a *Mullah* or *Ulema*) are bestowed authority and are commonly called upon to adjudicate disputes.[20]

Local powerholders and elders are generally brought together in a pan-village council, known as a *jirga* in Pashtun regions and a *shura* elsewhere. Such councils ordinarily only meet following the development of a problem, such as a land dispute or a breakdown in intra-communal relations, or to

[15] The referendum is organized employing the same village districts that were used for the CDC election. Community members are asked to indicate one subproject, that being their most preferred sub-project out of those listed on the ballot and the subprojects which receive the highest number of votes are implemented. At least 50% of eligible voters must vote for the referendum to be valid.
[16] (Kakar, 2005)
[17] (Kakar, 2005)
[18] The power of *Malik* / *Arbabs* is often dependent not just on the consent of the local community, but also on external commanders or centralized governing forces in the region (Kakar, 2005).
[19] (Kakar, 2005) notes that, as landowners may not necessarily live in the community, the position of *Malik* / *Arbab* may be held by someone other than a *Khan* / *Zamindar*.
[20] (Kakar, 2005)

perform funeral or wedding ceremonies, or receive important guests.[21] In accordance with *Shari'a*, the council is "expected to practice *ijma* (consensus seeking) and *shura* (consultation) as preconditions for competent and fair governance performance."[22]

Table 3: Summary of Functions of Traditional Powerholders

Powerholder	Customary Function
Malik / Arbab	Power broker and representative between community and centralized government; Resolves communal disputes and oversees of communal property
Mirab	Controller of community water canal
Khan / Zamindar	Large landowner provides jobs to laborers and land to sharecroppers; May also arbitrate conflicts
Ulema / Mullah	Religious leaders who lead prayers, give sermons and has power of moral judgment in the community; also involved in adjudicating conflicts based on Shariah
Jirga / Shura	Council that meets only as problems arise to solve them. Problems range from disputes to maintenance of communal property

Source: (Kakar, 2005)

The civil and political turmoil that has consumed Afghanistan over the past generation has predictably left its mark on structures of rural governance. Land reforms undertaken by communist administrations in the 1970s and 1980s commonly resulted in the appointment of a new *Malik* or *Arbab* and a reshuffling of village hierarchies.[23] These appointments were, however, undermined by the insurgency which developed following the Soviet invasion in 1979. Rural communities opposed to the Soviets appointed local *mujahedeen* as commanders, who were charged with organizing and arming "cadres of village soldiers who would fight under their command."[24] Substantial financial resources and materiel were channeled to commanders, enhancing their political standing considerably. Following the conclusion of the civil war in 1996, the ascendant Taliban regime complicated the governance structure further by installing new commanders.[25] Despite the superimposition of these structures of governance, traditional local institutions are considered to remain dominant in many areas.[26]

The NSP program attempts to promote the emergence of representative structures of governance in rural areas.[27] The legitimacy and authority of existing structures of governance, including both traditional and power-holders and paramilitary commanders are, to some extent, threatened by NSP. At times, active resistance has emerged from existing authorities and posed problems for program

[21] (Affolter, Noori, Sawayz, & Shrestha, 2006; Kakar, 2005)
[22] (Affolter, Noori, Sawayz, & Shrestha, 2006)
[23] (Kakar, 2005)
[24] (Affolter, Noori, Sawayz, & Shrestha, 2006)
[25] (Kakar, 2005)
[26] (Kakar, 2005)
[27] (Affolter, Noori, Sawayz, & Shrestha, 2006)

implementation.[28] Local power-holders have occasionally publicly opposed NSP, claiming that it is a *Khalqi* (Communist Party) program or is intended to convert people to Christianity.[29]

A number of FPs have, upon attempting to implement NSP, been presented by local authorities with a list of leaders to compose the CDC.[30] FPs mostly resisted such interference and where elections were held, FPs reported that those elected to the CDC often did not include those on such lists. In some cases, local power-holders who failed to gain office refused to accept the results of CDC elections, and in at least one case, resorted to violence in protest.[31] Such problems have generally been resolved with recourse to regional office holders, such as district authorities, or by holding a second CDC election.[32] Some FPs have also mollified concerns of power-holders by defining the function of CDCs in terms of project delivery, rather than general local governance.[33]

II.4. Overview of Study

The study seeks to examine the impact of the NSP program on the quality of governance and institutions and on measures of social and economic welfare.[34] The empirical strategy is to compare the average change in outcomes of interest in a 'treatment group' of 250 villages which receive NSP with the average change in outcomes of interest in a 'control group' of equal size which do not receive NSP until after the conclusion of the study.[35] Within the sample, villages were assigned randomly to the treatment or control group using a procedure discussed in Section IV.2 below.[36] In addition, the study seeks to examine the impact of the two alternative CDC election methods and project selection procedures on both the aforementioned set of indicators and others specific to the program. The assignment of these two 'sub-treatment interventions' was done randomly and independently, facilitating the estimation of both individual and interaction effects.

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[28] (Kakar, 2005) recounts the experience of one FP which, upon approaching a community, was rebuffed by the local *Malik* and elders who argued that a council already existed and that NSP should work through them. However, after the FP threatened to withdraw from the community, they agreed lest the community be excluded from NSP. The *Malik* was not elected in the CDC elections.

[29] FPs have attempted to counter negative propaganda by quoting passages from the *Qur'an* supporting the inclusion of women in the political process or by bringing in government representatives to voice their support for NSP (Kakar, 2005).

[30] (Kakar, 2005)

[31] (Kakar, 2005) notes a "case in Laghman where the Malik was not elected and started firing a weapon", causing "a person to be injured".

[32] (Kakar, 2005) notes an "instance in Herat where a local commander was not elected to a CDC, when he expected to be. He caused a lot of problems, so [FP] held elections again. In the second round of elections he was not elected either, but he was satisfied with the results and stopped working against the CDC."

[33] (Kakar, 2005)

[34] See Table 4 below for a summary of core outcome indicators

[35] Ethical concerns with randomization, particularly of social programs, are sometimes raised. However, when programs such as the NSP face resource constraints that restrict the number of villages that can be mobilized at any given time, randomization may in fact be the fairest means of determining program participation as the probability of any village receiving the program is equalized.

[36] The opportunity to randomly assign NSP within the sample was provided for by financial constraints, discussed above, which limited the number of villages which could be mobilized by NSP to 40 in each of the 74 'new' districts. However, this empirical strategy also restricted the population of districts from which the sample districts could be selected to those districts among the 74 'new' districts which had a minimum of 65 villages.

From the population of 74 'new' NSP districts which had not received NSP prior to the summer of 2007, 10 districts across 6 provinces in Afghanistan were selected to form the sample. The districts, displayed in Figure 2 below, are: Adraskan (Herat); Balkh (Balkh); Chisht-e Sharif (Herat); Daulina (Ghor); Farsi (Herat); Gulran (Herat); Hisarak (Nangarhar); Khost Wa Firing (Baghlan); Sang Takht (Daykundi); and Sherzad (Nangarhar). In each of the 10 districts, 50 villages were selected by participating FPs for inclusion in the study.[37]

In the 500 villages selected for inclusion in the study, a panel dataset of randomly selected male heads of household, as well as focus groups with local male and female community leaders, is to be constructed. During August and September 2007, a baseline survey of the 500 sample villages was undertaken, surveying 4,895 male heads-of-households, 489 male focus groups, 493 female focus groups, and 3,515 females individually. Two follow-up surveys are planned, which will attempt to re-interview the same individuals surveyed during the baseline survey.[38]

III. Related Research, Questions of Interest, and Working Hypotheses

The study seeks to estimate the impact of the NSP program through comparison of changes in outcomes of interest between a treatment group of villages, in which CDC elections are held and NSP-funded projects are implemented, and a control group of villages, which are governed by customary structures and which do not receive NSP-funded projects.[39] The core outcomes of interest for the study fall into two groups: (1) Social and Economic Welfare and (2) Governance and Institutions. Table 4 below summarizes the core outcome indicators in the two groups.

Table 4: Summary of Core Outcome Indicators

Social & Economic Welfare	Governance & Institutions
Consumption	**Governance Structures & Activities of Elites**
Production	**Participation of Women in Governance**
Assets	**Dispute Incidence**
Capital Markets	**Interpersonal Trust**
Access to Infrastructure	**Political Participation**
Access to Services	**Attitude towards Governance Structures**

In addition, the study seeks to estimate the average impact of introduced variation in the method of CDC elections and in the procedure by which projects are selected for NSP financing. The impact of this variation will be assessed both in terms of the core outcome indicators and program-specific variables, such as the composition of the CDC, the type of project selected, the legitimacy of the selected project, and contributions by villagers to the project.

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[37] The methods for selecting sample districts and villages are described in detail in Section IV.1 below.
[38] Methods of data collection are described in detail in Section IV.4 and Appendix I below.
[39] As all of the villages in the treatment group receive both a CDC election and a project grant, and the villages in the control group receive neither, the study will generally not be able to isolate the average impact of CDC elections and the average impact of the project grant. In this sense, institutional change is defined as the effect of both the CDC election and the disbursement of project grants.

The following three sections describe the hypotheses of the study, referencing related research where applicable. Section III.1 outlines hypotheses pertaining to the effect of NSP on the core outcome indicators, Section 0 outlines hypotheses pertaining to the interaction of NSP with pre-existing conditions, and Section III.3 outlines hypotheses pertaining to the impact of sub-NSP variation in the method of CDC election and project selection procedure.

III.1. Impact of NSP

The following section discusses the central questions of interest which will be used to assess the average impact of NSP, with each hypothesis summarized in mathematical form.[40] The hypotheses are divided between those related to economic and social welfare and those related to institutions and governance. Appendix II lists questions administered during the baseline survey which, in conjunction with data collected during the follow-up surveys, will be used to construct the measures used to evaluate these hypotheses.

Economic and Social Welfare

On average, it is expected that, relative to individuals living in villages in the control group, individuals living in villages which participate in NSP will experience an improvement in economic and social welfare. The following section discusses specific questions of interest pertaining to the impact of the program on outcomes relating to social and economic welfare:

1. **Access to Infrastructure and/or Services**: It is expected that the most significant social and economic effect of NSP will be observed on access to infrastructure and services and, specifically, along the dimension which corresponds to the type of project selected to receive financing from NSP. The hypothesis is summarized by the following equation, where the dependent variable measures changes in the level of service access corresponding to the type of project selected and NSP is a dummy variable which assumes a value of 1 if the individual i resides in a village which has been assigned to the treatment group and which assumes a value of 0 if the individual i resides in a village which has been assigned to the control group:

$$Access_i^{t+5} - Access_i^t = \alpha_i + \beta_1^E NSP_i^{t+1} + \varepsilon_i \qquad \text{where } \beta_1^E > 0 \quad H_1^E$$

2. **Average Level of Consumption and Assets**: NSP infuses significant economic resources into participating villages, which, in many cases, will be used to upgrade infrastructure and services which provide inputs for production.[41] It is expected that this will result in an increase in the level of consumption, which in turn will be reflected in

[40] On dependent and independent variables, superscripts denote time periods corresponding to phases of data collection: t denotes the period prior to the initiation of NSP activities (i.e., baseline survey); $t+1$ denotes the period during which CDC elections are held; $t+2$ denotes the period during which projects are selected; $t+3$ denotes the period during which projects are undertaken and completed; $t+4$ denotes the period following the completion of projects during which the first follow-up survey is administered; and $t+5$ denotes the period during which the second follow-up survey is administered. On dependent and independent variables, subscripts denote the unit of analysis: i denotes an individual villager; x denotes a member of the CDC or village leadership; and y denotes a village. On coefficients, superscripts denote the reference category to which the hypothesis falls into and the subscript denotes the reference number of the hypothesis within the reference category.

[41] See Table 1 above for a breakdown of the sectors served by NSP-financed projects

increased ownership of household assets. The hypothesis is summarized by the following equations:

$$Cons_i^{t+5} - Cons_i^t = \alpha_i + \beta_{2a}^E NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_{2a}^E > 0 \quad H_{2a}^E$$

$$Assets_i^{t+5} - Assets_i^t = \alpha_i + \beta_{2b}^E NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_{2b}^E > 0 \quad H_{2b}^E$$

3. **Inequality of Consumption and Assets**: It is hypothesized that NSP will impact not just the average level of consumption and assets, but will also reduce the level of intra-village inequality of consumption and assets. It is expected that, in the short-run, the effect will come primarily as a result of increases in consumption and assets among those involved in the construction of community projects. In the medium term, as the projects implemented with NSP financing become operational and impact production levels at the village-level, it is expected that increases in levels of consumption and assets will be broadly spread across the community, leading to further reductions in consumption and asset inequality. The hypothesis is summarized by the following equations:

$$Ineq.Cons_i^{t+5} - Ineq.Cons_i^t = \alpha_i + \beta_{3a}^E NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_{3a}^E < 0 \quad H_{3a}^E$$

$$Ineq.Assets_i^{t+5} - Ineq.Assets_i^t = \alpha_i + \beta_{3b}^E NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_{3b}^E < 0 \quad H_{3b}^E$$

4. **Average Level of Production**: It is expected that NSP will increase the level of income earned by individuals residing in villages participating in the program. The hypothesis is summarized by the following equation:

$$Prod_i^{t+5} - Prod_i^t = \alpha_i + \beta_4^E NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_4^E > 0 \quad H_4^E$$

5. **Diversification of Production**: It is expected that NSP will increase the diversity of income sources and of the crops cultivated, but only in the medium-term as projects financed by NSP increase the availability of production inputs (e.g. irrigation, water, vehicular access) and thereby facilitate diversification of economic activity. The hypothesis is summarized by the following equation:

$$Div.Prod_i^{t+5} - Div.Prod_i^t = \alpha_i + \beta_5^E NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_5^E > 0 \quad H_5^E$$

6. **Average Level of Borrowing**: It is expected that NSP will impact the level of borrowing, although the direction of the impact will depend on specific type of borrowing – that is, whether people are borrowing to attain basic subsistence following a negative income shock, to smooth consumption in anticipation of future increases in income, or to take advantage of profitable investment opportunities. NSP is expected to increase the availability of profitable income activities, leading to an increase in the level of borrowing for investment. The impact of NSP on borrowing for consumption or repayment of existing debt depends on whether the effect of liquidity or consumption-smoothing dominates. While in theory the direction of the effect is ambiguous, we expect liquidity considerations to dominate, so that people would incur lower debt towards consumption or repayment of the existing debt in NSP communities. The respective hypotheses are summarized by the following equations:

$$Bo.Inv_i^{t+5} - Bo.Inv_i^t = \alpha_i + \beta_{6a}^E NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_{6a}^E > 0 \quad H_{6a}^E$$

$$Bo.Cons_i^{t+5} - Bo.Cons_i^t = \alpha_i + \beta_{6b}^E NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_{6b}^E > 0 \quad H_{6b}^E$$

$$Bo.Rep_i^{t+5} - Bo.Rep_i^t = \alpha_i + \beta_{6c}^E NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_{6c}^E > 0 \quad H_{6c}^E$$

Institutions and Governance

NSP represents a potentially powerful *de jure* change in local structures of governance and channels for political participation and it is expected that the program will produce observable changes in the structure and function of village governance. The following section discusses specific questions of interest pertaining to the impact of the program on outcomes relating to institutions and governance:

1. **Governance Structures & Activities of Elites**: A key question of interest for the study is the impact of NSP on governance structures in participating villages. Recent work on institutions has introduced a distinction between *de jure* institutions, which are formally determined, and *de facto* institutions, which are determined by cultural, geographic, and historical factors and tend to persist over long periods of time.[42] The literature generally ascribes *de facto* institutions central prominence in the determination of economic and social outcomes, while *de jure* institutions are only of relevance in so far as they impact de facto institutional outcomes.[43]

   This study seeks to assess the extent to which the *de jure* institutional reform introduced by the creation of the CDC impacts *de facto* institutional outcomes, as measured by perceptions of the identity of village leaders, activities of village leaders, and levels of satisfaction with village leaders. It is expected that the NSP program's bundling of project grants with CDC elections will heighten the *de facto* institutional impact of the intervention and thus that changes in governance structures and activities of elites will be observed across the treatment group. This will be assessed by the identity of those who hold various positions in the village leadership, as perceived by survey respondents. The hypothesis is summarized by the following equation, where the dependent variable captures continuity in the leadership of the village:

$$Leaders_i^{t+5} - Leaders_i^t = \alpha_i + \beta_{1a}^G NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_1^G < 0 \quad H_{1a}^G$$

   We expect that such *de jure* institutional reforms will increase the accountability of village leaders and lower the incidence of elite behavior that villagers find disagreeable. The hypothesis is summarized by the following equation, where the dependent variable measures changes in villagers' discontent with existing structures of governance:

[42] The distinction between *de jure* and *de facto* institutions is discussed in detail in (Acemogulu & Robinson, 2006). The empirical case for the persistence of institutions is made in (Acemoglu, Johnson, & Robinson, 2001), which focuses on the impact of colonial rule on economic development in Africa, Asia, and Latin America, (Banerjee & Iyer, 2005), which examines the impact of colonial land tenure systems in India, and (Nunn, 2008), which examines the impact of the slave trade on economic development in coastal Africa.

[43] (Sokoloff & Engerman, 2000; Acemoglu, Johnson, & Robinson, 2001)

$$Discon_i^{t+5} - Discon_i^t = \alpha_i + \beta_{1b}^G NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_1^G < 0 \quad H_{1b}^G$$

2. **Participation of Women in Governance**: In villages participating in NSP, the gender-balanced CDC is introduced to overlap with customary governance structures, which in many of the survey districts are heavily male-dominated. Previous literature calls into question whether this shift in *de jure* institutions will result in a change in the *de facto* role of women in local governance.[44] However, due to the bundling of project grants with CDC elections, it is hypothesized that the *de jure* institutional shift introduced by NSP will have a more pronounced impact on *de facto* institutional structures than might otherwise be the case and thus that a greater role of women in village governance will be observed as a result of the introduction of the NSP program. The hypothesis is summarized with the following equation, where the dependent variable measures the participation of women in village governance:

$$Wo.Gov_i^{t+5} - Wo.Gov_i^t = \alpha_i + \beta_2^G NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_2^G < 0 \quad H_2^G$$

3. **Interpersonal Trust**: Findings from evaluations of CDD in other post-conflict settings indicate that programs similar to the NSP have a significant and positive impact on levels of interpersonal trust.[45] I is hypothesized thus that the introduction of NSP will increase levels of interpersonal trust:

$$Trust_i^{t+5} - Trust_i^t = \alpha_i + \beta_3^G NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_2^G > 0 \quad H_3^G$$

4. **Political Participation**: The NSP program creates direct channels for participation of villagers in local governance and increases the rewards of such participation. It is thus expected that individuals residing in villages which receive the NSP program will participate more substantively in local political institutions, such as meetings of the village *shura* or *jirga*.

$$Partic_i^{t+5} - Partic_i^t = \alpha_i + \beta_4^G NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_4^G > 0 \quad H_4^G$$

5. **Attitude towards Governance Structures**: It is expected that individuals residing in villages participating in the NSP program will have significantly more positive views towards central government authority and will have more favorable views towards taxation by the central government. These hypotheses are summarized with the following equations below:

$$Att.CenGov_i^{t+5} - Att.CenGov_i^t = \alpha_i + \beta_{5a}^G NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_{5a}^G > 0 \quad H_{5a}^G$$

[44] Studies that have examined the impact of changes in women's decision-making power include (Chattopadhyay & Duflo, Women as Policy Makers: Evidence from a Randomized Policy Experiment in India, 2004) and (Duflo & Topalova, Unappreciated Service: Performance, Perceptions, and Women Leaders in India, 2004)

[45] (Labonne & Chase, Who's at the Wheel when Communities Drive Development? The Case of the KALAHI-CIDSS in the Philippines, 2007) find the presence of a project notably improves local governance and social capital, especially for households who are involved in project activities.

$$Att.Tax_i^{t+5} - Att.Tax_i^t = \alpha_i + \beta_{5b}^G NSP_i^{t+1} + \varepsilon_i \quad \text{where } \beta_{5b}^G > 0 \quad H_{5b}^G$$

III.2. Interaction of NSP and Pre-Existing Conditions

Given the wide economic, ethnic, and cultural diversity in Afghanistan and the relative complexity of the economic and political changes that the NSP potentially induces, it is expected that significant variation in impacts will be observed and that these will be correlated with variation in pre-existing conditions such as ethnic diversity, income inequality, and the quality of pre-existing local governance structures. The following section outlines central questions of interest concerning interactions between pre-existing conditions and NSP impacts.

Ethnic Diversity

The effect of democratization in divided societies, or communities characterized by ethno-linguistic diversity, has emerged as a major area of interest for political scientists in recent years. In this study, to the extent that ethno-linguistic heterogeneity in our sample allows, we hope to provide evidence on how the existence of ethnic diversity may impact the success of initiatives to promote institutional change and provide public goods, such as the NSP. Our set of hypotheses and accompanying questions of interest are discussed further below:

1. **Economic and Social Welfare**: Research on ethnic fractionalization consistently finds a negative correlation between ethnic diversity and contributions to public goods, social capital, community trust, and attitudes towards leaders.[46] We therefore expect more ethnically diverse communities to be less efficient in using NSP financing. On the other hand, CDCs, as more representative democratic institutions, are likely to resolve these issues more effectively than indigenous local governing structures, weakening the negative effect of ethnic diversity on local governance. Hypotheses on the interaction of ethnic diversity and NSP on impacts relating to access to services, consumption, assets, and production is summarized by the equations below:

$$Access_i^{t+5} - Access_i^t = \alpha_i + \vartheta_{1a}^D NSP_i^{t+1} \cdot Ethnic_i^t + \beta_{1a}^D NSP_i^{t+1} + \gamma_{1a}^D Ethnic_i^t + \varepsilon_i \quad \text{where } \vartheta_{1a}^D = ?, \beta_{1a}^D > 0, \gamma_{1a}^D < 0 \quad H_{1a}^D$$

$$Cons_i^{t+5} - Cons_i^t = \alpha_i + \vartheta_{1b}^D NSP_i^{t+1} \cdot Ethnic_i^t + \beta_{1b}^D NSP_i^{t+1} + \gamma_{1b}^D Ethnic_i^t + \varepsilon_i \quad \text{where } \vartheta_{1b}^D = ?, \beta_{1b}^D > 0, \gamma_{1b}^D < 0 \quad H_{1b}^D$$

$$Assets_i^{t+5} - Assets_i^t = \alpha_i + \vartheta_{1c}^D NSP_i^{t+1} \cdot Ethnic_i^t + \beta_{1c}^D NSP_i^{t+1} + \gamma_{1c}^D Ethnic_i^t + \varepsilon_i \quad \text{where } \vartheta_{1c}^D = ?, \beta_{1c}^D > 0, \gamma_{1c}^D < 0 \quad H_{1c}^D$$

[46] (Wade, 1988; Alesina, Baqir, & Easterly, Public Goods and Ethnic Divisions, 1999; Alesina & La Ferrera, Who Trusts Others?, 2002; Miguel & Gugerty, Ethnic Diversity, Social Sanctions, and Public Goods in Kenya, 2005; Habyarimana, Humphreys, Posner, & Weinstein, 2007; Putnam, Leonardi, & Nanetti, Making Democracy Work: Civil Traditions in Modern Italy, 1994; Putnam, Bowling Alone: The Collapse and Revival of American Community, 2001)

$$Prod_i^{t+5} - Prod_i^t = \alpha_i + \vartheta_{1d}^D NSP_i^{t+1} \cdot Ethnic_i^t + \beta_{1d}^D NSP_i^{t+1} + \gamma_{1d}^D Ethnic_i^t + \varepsilon_i \quad \text{where } \vartheta_{1c}^D = ?, \beta_{1c}^D > 0, \gamma_{1c}^D < 0 \quad H_{1d}^D$$

2. **Dispute Incidence**: Traditionally, researchers have contended that, even in divided societies, the introduction of representative forms of governance reduce the potential for civil conflict by improving the alignment of policies pursued by power-holders with the demands of the constituency and by providing individuals and coalitions with a peaceful means to affect the course of policy.[47] However, recently some researchers have argued that the relationship between democracy and the incidence of conflict can be profoundly altered by underlying conditions, such as the existence of ethnic or social divisions, and that transitions to democracy may aggravate group-based tensions, promote clientalism, and provoke violence.[48] It is hypothesized thus that the introduction of NSP will reduce the incidence of disputes, but only in villages with minimal levels of ethnic diversity and no pre-existing tribal feuds. In villages with appreciable levels of ethnic diversity and/or pre-existing tribal feuds, it is hypothesized that the introduction of NSP will increase the incidence of disputes. This hypothesis is summarized with the following equation:

$$Disputes_i^{t+5} - Disputes_i^t = \alpha_i + \vartheta_2^D NSP_i^{t+1} \cdot Ethnic_i^t + \beta_2^D NSP_i^{t+1} + \gamma_2^D Ethnic_i^t + \varepsilon_i \quad \text{where } \vartheta_2^D > 0, \beta_2^D < 0, \gamma_2^D > 0 \quad H_2^D$$

3. **Interpersonal Trust**: While it is hypothesized that the introduction of NSP will increase levels of interpersonal trust in villages with minimal levels of ethnic diversity and no pre-existing tribal feuds, previous research indicates that the result could be quite different in villages with appreciable levels of ethnic diversity and/or pre-existing tribal feuds. This hypothesis is summarized by the following equation:

$$Trust_i^{t+5} - Trust_i^t = \alpha_i + \vartheta_3^D NSP_i^{t+1} \cdot Ethnic_i^t + \beta_3^D NSP_i^{t+1} + \gamma_3^D Ethnic_i^t + \varepsilon_i \quad \text{where } \vartheta_3^D > 0, \beta_3^D < 0, \gamma_3^D > 0 \quad H_3^D$$

4. **Governance**: The impact of NSP on attitudes towards local authorities will potentially depend strongly on ethnic diversity. In villages with low levels of ethnic diversity, it is expected that NSP will improve levels of satisfaction towards structures of local governance. However, in ethnically diverse villages, the introduction of NSP might raise the stakes for competing factions, exacerbate clientalism, and lower confidence of villagers in local structures of governance. Thus, we expect the positive effect of NSP on governance to be lower and possibly even negative in ethnically diverse communities. This hypothesis is summarized in the following equation, where the dependent variable measures changes in villagers' discontent with existing structures of governance:

[47] (Przeworski, Alvarez, Cheibub, & Limongi, 2000; Bardhan & Mookherjee, Capture and Governance at Local and National Levels, 2000; Bardhan & Mookherjee, Land Reform, Decentralized Governance and Rural Development in West Bengal, 2006; Platteau & Gaspart, The Risk of Resource Misappropriation in Community-Driven Development, 2003; Araujo, Ferreira, Lanjouw, & Ozler, 2006)

[48] (Snyder, 2000; Mansfield & Snyder, 2002)

$$Discon_i^{t+5} - Discon_i^t = \alpha_i + \vartheta_4^D NSP_i^{t+1} \cdot Ethnic_i^t + \beta_4^D NSP_i^{t+1} + \gamma_4^D Ethnic_i^t + \varepsilon_i \quad \text{where } \vartheta_4^D > 0, \beta_4^D < 0, \gamma_4^D > 0 \quad H_4^D$$

Income Inequality

The consequences of high levels of income inequality for democratization are considered to be analogous to those of ethno-linguistic diversity. Accordingly, the study hopes to explore how implementation of the NSP is impacted by the level of income inequality in villages, to the extent that is allowed by variation in the data collected in the baseline survey. In addition to the hypotheses in the section above, which could be adapted easily to the explore interaction effects with levels of inequality, two further hypotheses are discussed below, one pertaining to the impact of inequality on the types of projects selected in villages mobilized by the NSP and the other pertaining to the relationship between NSP and changes in the structures of governance:

1. **Selection of Projects:** Previous studies of CDD programs have indicated that high levels of inequality increase the probability of elite capture of projects. For example, research on the relationship between local inequality and project selection in Ecuador's Social Fund (FISE) found that, although the probability of a project targeted towards the poor being implemented increases with community poverty levels, it decreases with local inequality.[49] It is thereby hypothesized that elite capture of projects implemented under NSP is more likely in unequal communities and, thus, that we expect the type of projects selected for implementation in relatively unequal communities to be less closely associated with preferences of people elicited during the baseline survey. The following equation summarizes this hypothesis:

$$Proj.Selected_i^{t+2} = \alpha_i + \vartheta_1^Q Proj.Prefer_i^t + \beta_1^Q Proj.Pref_i^t \cdot Inequality_i^t + \varepsilon_i \quad \text{where } \vartheta_1^Q > 0, \beta_1^Q < 0 \quad H_1^Q$$

2. **Governance Structures:** Assuming that the pre-existing governance structures of villages with a high level of income inequality are more likely to be dominated by economic elites and assuming that, across all villages, CDCs result in a shift towards governance structures that are more representative of the general village population, it is expected that the impact of NSP on *de facto* institutional structures will be positively correlated with the pre-existing level of income inequality.

$$Leaders_i^{t+5} - Leaders_i^t = \alpha_i + \vartheta_2^Q NSP_i^{t+1} \cdot Inequality_i^t + \beta_2^Q NSP_i^{t+1} + \gamma_2^Q Inequality_i^t + \varepsilon_i \quad \text{where } \vartheta_2^Q > 0, \beta_2^Q < 0, \gamma_2^Q > 0 \quad H_2^Q$$

Pre-Existing Governance Structures

Finally, it is considered that the impact of NSP on several outcomes of interest will be impacted by the nature of pre-existing governance structures in villages. The first hypothesis considers the impact of variance in the pre-existing role of women in governance on changes relating to the participation

[49] (Araujo, Ferreira, Lanjouw, & Ozler, 2006)

of women in governance, while the second hypothesis discusses interrelationships between the NSP, pre-existing governance structures, and governance outcomes following the NSP:

1. **Participation of Women in Governance**: The relationship between the pre-existing status of women in villages receiving NSP and the impact of the program on the participation of women in governance is expected to be complex. In villages where women already have a significant role in local governance, the impact of NSP on women's participation may be minimal. On the other hand, however, in villages where women are not accorded any role in local governance, existing cultural constraints can be assumed to be too powerful to enable any significant impact of NSP on women's participation. It is thus expected that the relationship between pre-existing conditions and the impact will follow a non-linear pattern, with the greatest impact being observed in those villages where women assumed a limited, but not negligible, role in village governance. The following empirical specification summarizes the hypothesis:

$$Wo.Gov_i^{t+5} - Wo.Gov_i^t = \alpha_i + \vartheta_1^S Wo.Gov_i^t + \beta_1^S (Wo.Gov_i^t)^2 + \gamma_1^S Wo.Gov_i^t \cdot NSP_i^{t+1} + \varphi_1^S (Wo.Gov_i^t)^2 \cdot NSP_i^{t+1} + \omega_1^S NSP_i^{t+1} + \varepsilon_i \quad \text{where } \vartheta_1^S > 0, \beta_1^S < 0, \gamma_1^S > 0, \varphi_1^S < 0, \omega_1^S > 0 \quad H_1^S$$

2. **Governance Structures:** It is expected that the strength of pre-existing structures of governance will affect the impact of NSP on *de facto* institutional structures. Specifically, when existing structures are weak or non-existent, the impact of NSP on structures of governance and the activities of elites will be more pronounced that when such structures already in existence. This hypothesis is summarized in the following specification, where the dependent variable captures continuity in the leadership of the village:

$$Leaders_i^{t+5} - Leaders_i^t = \alpha_i + \vartheta_4^S NSP_i^{t+1} \cdot Gov.Strength_i^t + \beta_4^S NSP_i^{t+1} + \gamma_4^S Gov.Strength_i^t + \varepsilon_i \quad \text{where } \vartheta_4^S > 0, \beta_4^S < 0, \gamma_4^S > 0 \quad H_2^S$$

III.3. Impact of Sub-Treatment Interventions (STIs)

The study is also concerned with the impact of variations in the method by which the NSP program is implemented, known as "sub-treatment interventions". As both STIs were randomly assigned, it is feasibly to identify the individual effects of each intervention and any interaction effects between the sub-treatments. The following sections discuss the central questions of interest which will be used to assess the average impact of the STIs.

STI-1: CDC Election Method

From the standpoint of public welfare, the two different CDC election methods being implemented through STI-1 both offer their own advantages and disadvantages:

- The ward election method, which has hitherto been used by NSP to elect CDCs, mandates representation of each part of the village on the CDC.[50] In this sense, the ward election method is likely to result in a CDC which is more representative of different groups in the village. It is also generally considered that the ward election method facilitates accountability of CDC members by providing for a clear reporting mechanism between representatives and the ward that elected them;
- The at-large election method eschews constraints on the choice of voters and should thereby result in a CDC which is closer aligned to the preferences of the village constituency. As the increase in district magnitude associated with the at-large elections renders coordination more difficult, it is expected that at-large elections will be more competitive than ward elections. However, the nature of the representative relationship between CDC members elected through at-large elections is not likely to be as strong as those elected through ward elections.

The countervailing advantages of each election method make it difficult to make confident predictions as to how the variation will impact the main outcomes of interest for the study. Accordingly, hypotheses pertaining to the impact of variation in CDC election method focus on outcomes relating to CDC composition, project selection, and the quality of completed projects. The hypotheses, and accompanying formalizations, are presented below:

1. **Geographic Dispersion of CDC Members**: Due to the fact that ward elections mandate representation for each part of the village, it is expected that CDC members elected through ward elections will be more dispersed across the village. The hypothesis is summarized by the following equation, where the dependent variable measures the geographic dispersion of GPS coordinates of the houses of CDC members and AL is a dummy variable which assumes a value of 1 if the village y has been assigned an at-large election and which assumes a value of 0 if the village has been assigned a ward election:[51]

$$\frac{\sum_{i=1}^{n} GPS_x^2 - (\sum_{x=1}^{n} GPS_x)^2/n}{n-1} = \alpha_y + \beta_1^C AL_y^{t+1} + \varepsilon_y \qquad \text{where } \beta_1^C < 0 \quad H_1^C$$

2. **Education Level of CDC Members**: Assuming voters in CDC elections prefer to elect CDC members with formal education and that educated residents of the village are not evenly dispersed throughout the village, it is expected that CDC members elected through at-large elections will, on average, have higher levels of education than CDC members elected through ward elections. The hypothesis is summarized by the following equation, where the dependent variable measures the years of education of elected CDC member, x:

$$Years.Educ_x^{t+1} = \alpha_x + \beta_2^C AL_x^{t+1} + \varepsilon_x \qquad \text{where } \beta_2^C < 0 \quad H_2^C$$

[50] It is the responsibility of the FP to divide the village up into geographically contiguous wards. According to NSP guidelines, wards should contain not less than 5 families and not more than 25 families. Specific guidelines on how the division of villages into wards should occur is provided in the "STI-1 Guide for Social Organizers" issued by the evaluation team to FPs participating in the village.

[51] Where security conditions permit, GPS coordinates of the location of the houses of elected CDC members are collected during the CDC election monitoring exercise or the project selection monitoring exercise.

3. **Competitiveness of CDC Elections**: It is expected that at-large CDC elections will be more competitive than ward CDC elections, since the increase in the magnitude of districts for at-large elections is expected to reduce the efficacy of, and potential, for voter-intimidation or other attempts at coordinating the votes of villagers. In addition, voters in at-large elections are to have 3 votes, while voters in ward elections only have one vote, a difference which also reduces the chance of coordination in at-large elections.[52] The hypothesis is summarized by the following equation, where the dependent variable is the ratio of votes garnered by elected CDC member, x, to the total votes cast in the village, y:

$$\frac{Votes_x^{t+1}}{Votes_y^{t+1}} = \alpha_x + \beta_3^C AL_x^{t+1} + \varepsilon_x \qquad \text{where } \beta_3^C < 0 \quad H_3^C$$

4. **Elite Capture of CDC**: The effect of at-large elections on the probability of existing power-holders being elected to the CDC is ambiguous. On the one hand, the increase in district magnitude and the number of votes per individual that go along with at-large elections should reduce the efficacy of, and potential, for voter-intimidation or other attempts at coordinating the votes of villagers,[53] thereby limiting the 'incumbency advantage' and reducing the probability of incumbent village leaders being elected to the CDC. On the other hand and in so far as it can be assumed that 'incumbent' village leaders are concentrated in particular wards and that voters prefer to elect 'incumbents' to the CDC,[54] the elimination of geographic constraints in voting that accompany the at-large method may increase the probability of existing leaders being elected to the CDC. The question will be addressed with the following equation, where the dependent variable assumes a value of 1 if the elected CDC member x held a leadership position in the village at time t prior to the CDC election and a value of 0 otherwise.

$$Elite.CDC_x^{t+1} = \alpha_x + \beta_4^C AL_x^{t+1} + \varepsilon_x \qquad \text{where } \beta_4^C = ? \quad H_4^C$$

[52] The innovation of permitting three votes in at-large elections was requested by a number of the participating FPs who considered it a high probability that, if villagers were accorded only one vote in at-large elections, the number of vote-getting candidates would be less than the number of CDC seats (which is proportional to the number of households in the village), thereby necessitating multiple rounds of voting.

[53] Due to similar reasoning, the districts for the parliament of Afghanistan (*Wolesi Jirga*) were set at the province level. As provinces in Afghanistan are relatively large (there are 34 in the whole country), this made it both more difficult for prospective candidates to intimidate potential voters in the lead-up to the election and more difficult for unsuccessful candidates to punish voters in the aftermath of the election. For similar reasons, the results of the presidential election in 2005 were tallied only at the provincial level.

[54] Some readers may object to his assumption, arguing that villagers may not necessarily "prefer" to elect incumbent power-holders, but feel compelled to do so, either by cultural norms or by active intimidation by incumbents and their proxies. There are a few ways in which the study may be able to determine whether incumbent-capture of CDCs arises as a result of voter-preferences, on the one hand, or active or passive intimidation, on the other hand. For example, the change in attitudes towards leaders ex-ante and ex-post should inform if villagers are happy with their leaders and the way their leaders treat them. Another way would be to look at the project preferences of leaders and those of their constituents. The more these preferences align, the more likely it is that these leaders were elected fairly.

5. **Alignment of Selected Projects with Villagers' Preferences (Project Type)**: During the baseline survey, data was collected on the preferences of both villagers and power-holders for NSP projects. Accordingly, it will be feasible to determine the extent to which projects selected for NSP financing align with the relative interests of the two groups.[55] A key question of interest will be the impact of CDC election method on the alignment of selected projects with the *ex-ante* preferences of villagers, on the one hand, and village power-holders, on the other hand (hereafter referred to as 'project type').

   Existing studies of elite capture in CDD programs indicate that local elites tend to promote their own preferred projects, which turn out not to represent people's perceived community needs, but that constituents are often satisfied with the projects they receive.[56] Yet other works find no evidence for elite capture and suggest that project proposals prove to be equally representative of elites as well as their constituents.[57]

   In this study, it is hypothesized that the incidence of elite capture of projects will be highly correlated with the ability of elites to capture CDCs. The hypothesis is summarized with the following equation, where the dependent variable measures the probability that the selected project aligns more with the preferences of existing power-holders than with the preferences of villagers:

$$Proj.Align_y^{t+2} = \alpha_y + \beta_5^C AL_y^{t+1} + \varepsilon_y \qquad \text{where } \beta_5^C \approx \beta_4^C \qquad H_5^C$$

6. **Location of Selected Projects**: In ward elections, CDC members are elected by only a segment of the village population, while in at-large elections, CDC members are effectively elected by the whole village. In the former case, it is to be expected that CDC members will advocate first for projects which benefit their ward, with the welfare of the whole village serving as a secondary consideration. Thus, if CDC members elected through ward elections are more likely than their at-large counterparts to advocate primarily for projects favored by their respective ward and, if some CDC members are more persuasive than others owing to pre-existing positions of village authority (such as village headman or commander) and/or positions of CDC authority (president, vice-president, treasurer, and secretary), it can be expected that ward election methods will increase the probability of selected projects being situated (or otherwise disproportionately serving) the ward(s) of the most powerful CDC member(s). The hypothesis is summarized by the following equation, where the dependent variable measures the geographical distance between the location of the selected project and the household of the more powerful CDC members:

$$Distance_x^{t+2} = \alpha_x + \beta_6^C AL_x^{t+1} + \varepsilon_x \qquad \text{where } \beta_6^C > 0 \qquad H_6^C$$

[55] Similar exercises are performed in (Olken, 2007) and in (Labonne & Chase, Who's at the Wheel when Communities Drive Development? The Case of the KALAHI-CIDSS in the Philippines, 2007).

[56] (Rao & Ibáñez, 2005; Owen & Van Domelen, 1998; van Domelen, 2002)

[57] (Labonne & Chase, Who's at the Wheel when Communities Drive Development? The Case of the KALAHI-CIDSS in the Philippines, 2007) finds that households that are more active in the community are in turn more likely to have their desires reflected in community proposals.

7. **Project Awareness**: In theory, ward elections provide a better reporting structure between CDC members and their constituents. While CDC members elected under at-large elections are assigned a "reporting ward," there is no guarantee that they will actually live in that ward. This could make reporting more difficult than under ward elections, where each CDC member reports to the ward in which they reside. Thus, in so far as ward elections promote a more functional reporting structure than at-large elections, it is expected that individuals residing in ward election villages will display a greater awareness about the specifics of the project(s) financed by NSP than their counterparts in at-large election villages. The hypothesis is summarized by the following equation, where the dependent variable measures the awareness of individuals concerning the specifics of selected projects:

$$Awareness_i^{t+3} = \alpha_i + \beta_7^C AL_i^{t+1} + \varepsilon_i \quad \text{where } \beta_7^C < 0 \quad H_7^C$$

8. **Quality of Projects**: In so far as it is hypothesized that at-large elections increases the probability of CDC members being formally educated, it is also hypothesized that at-large elections will increase the capability of CDCs to manage projects financed by NSP and thereby ensure a higher standard of completed projects. It is proposed that the higher standard of completed projects should result in an increased level of change in the level of service access corresponding to the type of project selected. This hypothesis is summarized by the following equation, where the dependent variable is similar to that of hypothesis H_1^E :

$$Access_i^{t+5} - Access_i^t = \alpha_i + \beta_1^E AL_i^{t+1} + \varepsilon_i \quad \text{where } \beta_8^C > 0 \quad H_8^C$$

STI-2: Project Selection Procedure

The introduction of variation into the project of selection procedure is inspired by a similar experiment implemented by (Olken, 2007) for Indonesia's *Kecamantan* Development Program (KDP). This sub-treatment intervention seeks to compare the effect of selecting projects through a deliberative, but largely CDC-driven process, with the effect of selecting projects through a directly democratic, secret-ballot referendum. As with the variation in CDC election method, the two selection procedures each offer various advantages and disadvantages:

- The secret-ballot referendum grants each villager a formal and equal role in selecting projects for NSP funding. This procedure limits the influence of local elite on the process of selecting the projects, which should make the choice of the projects more closely aligned with the preferences of the village population. In addition, it may increase the perceived fairness of the process and improve the attitudes of the people towards the program;[58]

[58] The study of (Olken, 2007) found that that, in general, villagers appreciated the opportunity to formally participate in village selection, resulting in "dramatically higher satisfaction, increased knowledge about the project chosen, greater perceived benefits from the project, and higher reported willingness among villagers to contribute supplementary funds and labor to the project" in referendum villages. However, the study found no difference in the type or location of projects selected through the two competing procedures

- The consultation meeting procedure to select projects allows villagers to express their opinions in a public forum and thereby to potentially reach a consensus, based on reasoned discussion, as to which project is most appropriate. In leaving the final decision with CDC members, the procedure also permits CDC members to draw on background knowledge or expertise in making the final selection of projects.

As with CDC elections, the relative welfare impact of each procedure is ambiguous. Accordingly, hypotheses pertaining to the impact of variation in CDC election method focus on outcomes relating to CDC composition project selection and quality. The hypotheses, and accompanying formalizations, are presented below:

1. **Project Type**: Secret-ballot referendums should limit elite capture of project selection and ensure that the selected projects better reflect the preferences of the general village public. The hypothesis is summarized by the following equation, where the dependent variable measures the probability that the project selected by village y aligns more with the preferences of existing power-holders than with the preferences of villagers and REF_y^{t+1} is a dummy variable which assumes a value of 1 if the village y selects projects through a secret-ballot referendum and which assumes a value of 0 if the village selects projects through a consultation meeting:

$$Proj.Align_y^{t+2} = \alpha_y + \beta_1^P REF_y^{t+2} + \varepsilon_y \quad \text{where } \beta_1^P > 0 \quad H_1^P$$

2. **Location of Selected Projects**: In so far as secret-ballot referendum procedures for selecting projects limit the influence of CDC on the type of projects selected, it is also expected that the influence of CDC members of the location of projects will be similarly reduced when projects are selected by secret-ballot referenda. The hypothesis is summarized by the following equation, where the dependent variable measures the geographical distance between the location of the selected project and the household of the more powerful CDC members in village y:

$$Distance_y^{t+2} = \alpha_y + \beta_2^P REF_y^{t+2} + \varepsilon_y \quad \text{where } \beta_2^P > 0 \quad H_2^P$$

3. **Program Satisfaction**: The findings of (Olken, 2007) indicate that individuals residing in referendum villages express significantly higher levels of satisfaction with the program relative to individuals residing in villages where project selection is conducted by other means. Accordingly, it is expected that referendums will be associated with significantly increased levels of satisfaction with the NSP program. The hypothesis is summarized by the following equations, where the dependent variable measures the satisfaction of individual villagers with the NSP program:

$$Prog.Satis_i^{t+3,t+4,t+5} = \alpha_i + \beta_3^P REF_i^{t+2} + \varepsilon_i \quad \text{where } \beta_{3a}^P > 0 \quad H_3^P$$

4. **Governance Structures**: It is expected that, if individuals residing in villages assigned to select projects through secret-ballot referenda indeed express higher levels of satisfaction with the NSP program, this will lead to an increased legitimacy for the CDC. Thus, it is hypothesized that the recognition of CDC members as village leaders will be correlated with the selection of projects through a secret ballot referendum. The hypothesis is summarized by the following equation, where the dependent variable assumes a value of

1 if a given individual x is cited as holding a position of leadership in the village by respondent i and 0 if they are not:, and the independent variable, $CDC.Member$, assumes a value of 1 if the given individual x is a member of the CDC:

$$Leader_x^{t+5} = \alpha_x + \gamma_4^P CDC.Member_x^{t+1} + \vartheta_4^P CDC.Member_x^{t+1} \cdot REF_y^{t+2} + \beta_4^P REF_i^{t+2} + \varepsilon_x \quad \text{where } \vartheta_4^P > 0, \beta_4^P = 0, \gamma_4^P > 0 \quad H_4^P$$

5. **Community Contribution**: An important component of the NSP program is the 'community contribution,' which mandates that villages participating in NSP must contribute at least a specified proportion of the costs of projects selected for NSP financing. FPs implementing NSP report that it is not altogether rare for villages to contribute in excess of the mandatory minimum community contribution and it is expected that the project selection procedure will impact this. In particular, it is expected that, in so far as individuals residing in referendum villages will display higher levels of satisfaction towards projects selected for NSP funding, it is also expected that individuals residing in referendum villages will, on average, contribute a higher proportion of the costs of selected projects. This hypothesis is further suggested by a finding in (Olken, 2007) that people claim to be more willing to contribute to projects selected directly by the population of the village. The hypothesis is summarized by the following equation, where the dependent variable measures the average level of community contributions:

$$Contributions_y^{t+2} = \alpha_y + \beta_5^P REF_y^{t+2} + \varepsilon_y \quad \text{where } \beta_5^P > 0 \quad H_5^P$$

6. **Project Awareness**: Following a further finding of (Olken, 2007), it is expected that individuals residing in referendum villages will display a greater awareness about the specifics of the project(s) financed by NSP than their counterparts in consultation meeting villages. The hypothesis is summarized by the following equation, where the dependent variable measures the awareness of individuals concerning the specifics of selected projects:

$$Awareness_i^{t+3} = \alpha_i + \beta_7^P REF_i^{t+2} + \varepsilon_i \quad \text{where } \beta_6^P > 0 \quad H_6^P$$

7. **Quality of Projects**: In so far as it is expected that individuals in referendum villages will display a greater awareness of projects implemented with NSP financing and will contribute more to the costs of projects, it is also expected that individuals in referendum villages will more closely monitor the quality of project implementation and will exert greater pressures on CDC members to provide effective management of projects. It is expected that, in referendum villages, this will increase the quality of NSP-financed projects and the access to infrastructure and/or services corresponding to the type of project selected. This hypothesis is summarized by the following equation, where the dependent variable is drawn from hypotheses H_1^E and H_8^C:

$$Access_i^{t+5} - Access_i^t = \alpha_i + \beta_1^E REF_i^{t+2} + \varepsilon_i \quad \text{where } \beta_7^P > 0 \quad H_7^P$$

Interaction of STI-1 & STI-2

The independent and random assignment of each of the two sub-treatment interventions enables the identification of interaction effects between the two interventions. The four combinations are presented in the table below:

Figure 3: Assignments of Sub-Treatment Interventions

	Project Selection Procedure	
CDC Election Method	**Group 1**	**Group 2**
	At-Large Elections Consultation Meeting	At-Large Elections Referendum
	Group 3	**Group 4**
	Ward Elections Consultation Meeting	Ward Elections Referendum

The hypotheses, and accompanying formalizations, are presented below:

1. **Project Type**: At-large elections are likely to reduce elite capture of CDC and, thus, to increase the alignment of the selected projects with the preferences of population. Project selection through referenda is likely to have the same effect. As a result, we expect the combination of an at-large election and referendum to result in the selection of projects most closely aligned with the preferences of the population, although whether or not there is sufficient reason to expect an additional interaction effect between at-large elections and referenda. The hypothesis is summarized by the following equation:

$$Proj.Align_y^{t+2} = \alpha_y + \gamma_1^N AL_y^{t+1} + \vartheta_1^N AL_y^{t+1} \cdot REF_y^{t+2} + \beta_1^N REF_i^{t+2} + \varepsilon_y \quad \text{where } \gamma_1^N > 0, \vartheta_1^N = ?, \beta_1^N > 0 \quad H_1^N$$

2. **Location of Selected Projects**: Similar to project type, it is expected that the combination of at-large CDC elections and project selection by referendum will result in the location of projects being least affected by the location of the household of powerful CDC members. Again, though, it is unclear whether there is sufficient reason to expect an added interaction effect. The hypothesis is summarized by the following equation:

$$Distance_y^{t+2} = \alpha_y + \gamma_2^N AL_y^{t+1} + \vartheta_2^N AL_y^{t+1} \cdot REF_y^{t+2} + \beta_2^N REF_i^{t+2} + \varepsilon_y \quad \text{where } \gamma_2^N > 0, \vartheta_2^N = ?, \beta_2^N > 0 \quad H_2^N$$

3. **Project Awareness**: In villages where projects are selected by referendum, the village population is likely to be more informed about the proposed projects and, by extension, the selected projects. Ward elections are generally considered to provide a better reporting structure between CDC members and their constituents and thereby will lead to villagers being more informed about village projects. Thus, the combination of a ward election and project selection referendum will increase both demand and supply of information regarding the projects, which will lead to the highest level of awareness of

the selected projects. Again, though, whether the combination will produce an interaction effect in addition to the individual impacts remains ambiguous. The hypothesis is summarized with the following specification:

$$Awareness_i^{t+3} = \alpha_y + \gamma_3^N AL_y^{t+1} + \vartheta_3^N AL_y^{t+1} \cdot REF_y^{t+2} + \beta_3^N REF_i^{t+2} + \varepsilon_y \quad \text{where } \gamma_3^N < 0, \vartheta_3^N = ?, \beta_3^N > 0 \quad H_3^N$$

4. **Quality of Projects**: It is expected that at-large CDC elections will result in the election of CDC members with higher average levels of education and that this, in turn, will result in an improved quality of projects. Selection of projects by referendum, in turn, is expected to increase community monitoring of project implementation and, in turn, improve the quality of completed projects. Thus, we expect the combination of at-large CDC elections and project selection by referendum to most beneficially impact project quality and, by extension, the impact of the implemented projects on the respective dimension of service access. As with the above hypotheses, though, it is unclear whether an additional interaction effect can be expected. The hypothesis is summarized by the following specification:

$$Access_i^{t+5} - Access_i^t = \alpha_y + \gamma_4^N AL_y^{t+1} + \vartheta_4^N AL_y^{t+1} \cdot REF_y^{t+2} + \beta_4^N REF_i^{t+2} + \varepsilon_y \quad \text{where } \gamma_4^N > 0, \vartheta_4^N = ?, \beta_4^N > 0 \quad H_4^N$$

IV. Research Design

The study seeks to evaluate the hypotheses described in Section III.1 and 0 above by comparing changes in outcomes over time between 250 villages randomly assigned to the treatment group, which are to receive NSP, and 250 villages randomly assigned to the control group, which are not to receive NSP until after the conclusion of the study.[59] The hypotheses pertaining to STI-1, described in Section III.3 above, are to be evaluated by comparing changes in outcomes between the 125 villages assigned to elect CDCs with ward elections and the 125 villages assigned to elect CDCs with at-large elections. The hypotheses pertaining to STI-2, also described in Section III.3 above, are to be evaluated by comparing changes in outcomes between the 125 villages assigned to select projects by referenda and the 125 villages assigned to select projects by consultation meeting.

The following sections detail the methodology of the study and the means by which data is to be collected to evaluate the aforementioned hypotheses. Section IV.1 details the methods used to select the sample; Section IV.2 describes the general methodological framework and then details the mechanism used to select sample units for treatment and sub-treatment; Section IV.3 discusses limitations of the study design and potential complications which may arise in the implementation of the study; and Section IV.4 provides an overview of the data collection process.

[59] Our evaluation falls under the rubric of a "place-randomized" trial (Murray, 1998; Donner & Klar, 2000; Boruch, et al., 2004) (Murray 1998; Donner and Klar 2000; Boruch et al.2004)

IV.1. Sample Selection

The selection of the sample for the study proceeded in two stages. First, 10 districts were selected from the approximately 398 districts in Afghanistan to be included in the study. Secondly, 50 villages were selected from the list of villages in each of the 10 sample districts. The procedure for making selecting the districts and the villages is described below:

Selection of Sample Districts

The selection of districts was guided by three main considerations: (1) 'New' NSP Districts; (2) Security; and (3) Minimum of 65 Villages. Each of these considerations is described in turn:

1. **'New' NSP Districts**: As of March 31, 2007, NSP activities had occurred in villages in approximately 279 of the 398 districts in Afghanistan. As discussed in Section II.1 above, the second phase of the NSP program (NSP-II) aims to both mobilize approximately 2,000 villages in districts where not all of the villages have been mobilized by NSP and to mobilize approximately 2,300 villages in 74 districts where no villages have been mobilized by NSP. In these 74 districts, financial constraints at the commencement of NSP-II limited the number of villages that could be mobilized by NSP to 40.

   Due to the fact that the number of villages in districts in Afghanistan often exceeds 40, the limitation on NSP activities in new districts implied that allocation of the program would be rationed through some mechanism.[60] This, and the lack of any reliable data sources to assess the relative needs of villages within villages, facilitated the opportunity to introduce a randomized mechanism for assigning the program within some of the 74 'new' NSP districts.

   In order to facilitate an experimental design, sample districts were selected exclusively from the 74 'new' districts where NSP had not commenced prior to March 31, 2007. A conscious decision was thus made to compromise the external validity of the study in order to ensure the effects of interest could be precisely estimated within the selected sample.[61]

2. **Security**: During the time of the planning of the baseline survey, security conditions in many parts of Afghanistan were deteriorating rapidly. In parts of the country where anti-government elements are known to be active, it is considered suicidal to carry any documents or other materials or equipment which might indicate an affiliation with the government. Enumerators involved in the baseline survey for this study would be at added risk as they would have to stay within assigned districts for up to a month, providing ample opportunity for anti-government elements to become aware of their activities and undertake hostile actions.

   Reducing the security risk to those involved in the baseline survey and subsequent forms of data collection was a primary consideration when selecting the sample districts for the study. The security situation of each of the 74 'new' NSP districts was assessed by the team leaders of the Vulnerability Analysis Unit (VAU) of MRRD, which was contracted

[60] According to the village listing provided to the authors by the Central Statistics Office (CSO), the mean number of villages in the 74 'new' NSP districts is 80.

[61] A list of these 74 'new' NSP districts, complete with information relevant to the selection process, is presented in Appendix III.

to implement the baseline survey for the study and which also has attained unparalleled experience in conducting households surveys in Afghanistan through the administration of the 2003, 2005, and 2007-08 National Risk and Vulnerability Assessments (NRVA). In addition, where feasible, FPs provided additional information on the security of districts for which they were contracted. Security concerns eliminated 34 of the 74 'new' NSP districts from consideration for inclusion in the baseline survey.

3. **Minimum of 65 Villages**: In order to ensure that the number of sample villages in each of the sample districts is satisfactory to yield inferences, the authors used lists of villages by district from the Central Statistics Office (CSO), Ministry of Rural Rehabilitation and Development (MRRD), and United States Agency for International Development (USAID) to identify those districts which contained a minimum of 65 villages. The specific minimum of 65 villages was required by the NSP assignment procedure devised by the evaluation team whereby FPs operating in sample districts would be asked to select one group of 50 villages for inclusion in the impact evaluation (of which 25 would be randomly selected for participation in NSP) and another group of 15 villages which would be excluded from the evaluation, but to which could be guaranteed participation in NSP. Obviously, it would be infeasible to implement this assignment procedure in districts which had less than 65 villages. As limited information was available about the relative accuracy of the village lists from CSO, MRRD, and USAID, the decision was made to select only districts which met the 65-village minimum threshold across all three lists. Of the 74 'new' NSP districts, 23 districts met this criterion.

The evaluation team identified 11 'new' NSP districts which were deemed safe for survey activities and which were deemed, with reasonable certainty, to contain at least 65 villages. Of these 11 districts, one (in Daykundi district) was not contracted to a FP at the latter planning stages for the NSP baseline survey. Thus, the three criteria employed effectively selected the 10 sample districts, which are Balkh district in Balkh province; Khost Wa Firing distrct in Baghlan province; Sang Takht district in Daykundi province; Daulina district in Ghor province; Adraskan, Chist-e Sharif, Gulran, and Farsi districts in Herat province; and Hisarak and Sherzad districts in Nangarhar province. Figure 2 below shows the location of the 10 sample districts.

The 10 sample districts provide a reasonably balanced sample of Afghanistan's ethnic and geographic diversity, subject to the constraints imposed by current security conditions. The 10 sample districts cover the western (Adraskan, Farsi, and Gulran), central highlands (Chist-e Sharif, Daulina, and Sang Takht), northern (Balkh), north-eastern (Khost Wa Firing), and eastern (Hisarak and Sherzad) regions, leaving southern Afghanistan as the only major region not included in the sample. The 10 districts also provide a reasonably representative sample of Afghanistan's ethno-linguistic diversity, with five predominantly Tajik districts (Adraskan, Chist-e Sharif, Gulran, Daulina, and Khost Wa Firing), four predominantly Pashtun districts (Balkh, Farsi, Hisarak, and Sherzad), and one predominantly Hazara district (Sang Takht). Balkh and Gulran also contain significant numbers of Uzbek and Turkmen minorities, respectively.

FPs assigned to work in the 10 sample districts provide for a mix of small and large, international and Afghan NGOs that reflects the diversity of FPs contracted to implement NSP across Afghanistan. Seven different FPs are contracted to mobilize communities in the 10 sample districts. Three of the districts (Balkh, Hisarak, and Khost Wa Firing) are contracted to People-in-Need (PiN), a Czech NGO. Two of the districts (Gulran and Sherzad) are contracted to the International Rescue Committee (IRC), an NGO head-quartered in the United States. Adraskan district is contracted to NPO/RRAA, an Afghan NGO; Chist-e Sharif to InterCooperation, a Pakistani NGO;

Daulina district to AfghanAid, a UK-based NGO; Farsi district to Coordination of Humanitarian Assistance (CHA), an Afghan NGO; and Sang Takht district is contracted to Oxfam UK.

Figure 2: Ten Sample Districts

Note: Boundaries of 10 sample districts are marked in red; provincial boundaries in pink; major rivers in light blue; district capitals with small blue stars; and Kabul with a large black star

Selection of Sample Villages

In each of the 10 sample districts, the FP contracted to that district was given responsibility for selecting the 50 sample villages to be included in the evaluation, with the understanding that the evaluation team would randomly select 25 of the 50 sample villages for NSP participation. This approach was adopted to ensure that the procedures of the evaluation didn't impose unnecessary logistical costs or complications for participating FPs.[62] It was also motivated by the assumption that allowing FPs to select the sample villages would minimize the probability of sample villages being

[62] One of the participating FPs initially requested that the evaluation team make the selection of the 50 sample villages. However, once the evaluation team made the selection, the FP realized that the mobilization of the 50 villages selected by the evaluation team would be relatively resource-intensive. The FP thus requested – and was granted – the opportunity to select the 50 sample villages.

ineligible for participation in NSP due to small size, or which, for security, political, or other reasons, would otherwise create problems if surveyed and/or mobilized by NSP.[63]

The evaluation team did, however, constrain the list of villages which could be selected by FPs for inclusion in the sample to those villages for which the evaluation team possessed GPS coordinates and demographic and infrastructure data.[64] The reason for constraining the selection in this manner was to facilitate the matched-pair randomization procedure, described in Section IV.2 below, and to ensure survey teams had the necessary information to accurately locate and survey the 50 sample villages in each district. Maps of the list of villages eligible for selection and the 50 sample villages selected by the FP are presented in Appendix IV. The graphs inform that, in districts occupying a large geographic space and containing a large number of villagers, FPs generally selected villages located close to the district center or main roads, as opposed to outlying villages which are more difficult to access.[65]

Lists of villages for which the evaluation team possessed the necessary data were provided to the participating FPs, who were then given a number of weeks to make the selection.[66] FPs were encouraged to consult with local provincial and district authorities when making the selection of the 50 sample villages to ensure that they were informed about the process and that the selection of the 50 sample villages incorporated their preferences.[67] The evaluation team informed participating FPs that the selection of the 50 sample villages would be irrevocable and that they, therefore, should be careful to only select villages which were suitable for both survey activities and potential participation in the NSP program.[68]

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[63] The MRRD list of villages in each district provided information concerning the number of households in each village. Theoretically, this could be used to determine which villages met the 25 household threshold necessary to participate in NSP as an independent community. However, the reliability of the data in the MRRD list could not be confirmed. In addition, there were a number of other factors, such as accessibility and security conditions, for which the evaluation team did not have data, but which could have a severe impact on the capacity of a village to be effectively surveyed and mobilized by NSP.

[64] Of the three village lists to which the evaluation team had access, only the MRRD lists contained demographic information and only the CSO list contained GIS coordinates. In most cases, the names of villages on the MRRD and CSO lists would match up, but occasionally no matches could be found for individual villages. In Farsi, the necessity of matching up location information from the CSO dataset with demographic information from the MRRD dataset reduced the number of 'effective' villages which could be included in the evaluation from approximately 92 to 66.

[65] A notable exception in this regard is Daulina district, where villages in all parts of the district were selected for inclusion in the evaluation.

[66] The number of villages in the 10 sample districts which satisfied these criteria ranged from 66 in Farsi district to 273 in Sang Takht district.

[67] It is unclear how often this happened. In one district, complications with local authorities later arose because they had not been consulted during the process of selecting the 50 sample villages and had formulated their own list of villages in the district they wanted to participate in NSP. Following intervention by the NSP office, the local authorities eventually accepted that the list of 25 NSP sample villages which had been randomly selected from the list of 50 sample villages.

[68] It was assumed by the evaluation team that the local staff of the contracted FPs would either be knowledgeable or would conduct a survey of the district to identify which villages were suitable for participation in NSP. In a number of districts, this assumption seemed to be improperly founded. During the baseline survey, enumerators arrived in one village to find that it had been depopulated and was therefore ineligible for participation in NSP. In another case, the evaluation team was informed by the FP itself that one of the villages that it had selected for inclusion in

In addition to the 50 sample villages, FPs selected 15 additional 'priority' villages in the district for participation in NSP. This was done in order to meet political or humanitarian imperatives dictating the prioritization of particular villages for NSP without jeopardizing the integrity of the empirical strategy for inference. The only constraint that was imposed on the selection of these 15 'priority' villages was that none of them appear in the list of 50 'sample' villages.[69]

Although the evaluation team tried to insist that the selection of the 15 'priority' villages be finalized before the allocation of NSP within the 50 sample villages, time constraints prevented this in a number of cases. Thus, the selection of the 15 'priority' villages sometimes took place after the 25 NSP sample villages and 25 non-NSP sample villages were known to the FP. In order to prevent contamination of the control group, the evaluation team took all feasible steps to ensure that the 15 'priority' villages did not overlap with the 25 NSP sample villages and, where GPS coordinates were available, were located a significantly far distance away from them. To identify instances of possible contamination, the evaluation team is independently collecting GPS coordinates of the 15 'priority' villages in each of the 10 districts and assessing their proximity to members of the control group.

IV.2. Assignment of Treatment

The following sections outline the methodology for the study. An introductory section provides a general framework for causal inference, drawing heavily on (Duflo, Glennerster, & Kremer, Using Randomization in Development Economics Research: A Toolkit, 2006), while the main section outlines the treatment assignment mechanism that was employed to select sample villages for participation in NSP and then for assignment of the various STI combinations.

General Framework

The central challenge of program evaluation is to identify the effect of the imposition of a program - and only that program - on selected outcomes of interest. Yet, in order to precisely estimate this effect, it would be necessary to know what would have happened in the absence of the program among the units that did receive the program, an observation that is, of course, impossible. Formally, assume Y_i^T is the outcome for unit i if the program is implemented and Y_i^C is the outcome for unit i if the program is not implemented.[70] The quantity of interest - the effect of the program on unit i - is the difference between the outcome observed when unit i receives the program and the outcome observed when unit i did not receive the program, $Y_i^T - Y_i^C$. Yet, since for any one unit, only one outcome is observed (Y_i^T for the units affected by the program and Y_i^C for all other units), it is impossible to estimate the effect of the program for individual units.

As it is impossible to observe both the outcome following the assignment of a program to a unit and the outcome had the program not been assigned, program evaluation is necessarily constrained to deriving estimations of the average impact of the program on units within a population:

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the sample (and which was assigned to the treatment group) only had 7 households and was therefore ineligible for NSP participation.

[69] In at least one case, a participating FP ignored this constraint and selected a number of 'priority villages' which had been selected as members of the control group.

[70] The unit of analysis can either be individuals or households that live in the community, affected by the program, the community as a whole or a larger area such as county or district in which the program was implemented.

$$\mathrm{E}\left[Y_i^T - Y_i^C\right] \quad (1)$$

Assuming that there exists data on outcomes for a 'treatment group' of units that received the program, $Y^T|T$, and on outcomes for a 'control group' of units that did not receive the program, $Y^C|C$, we can then examine the difference in outcomes between the two groups and draw inferences over the effect of the program.[71] In a large sample, this difference will converge to:

$$\mathrm{E}[Y_i^T|T] - \mathrm{E}\left[Y_i^C|C\right] \quad (2)$$

In order to demonstrate the implications of pre-existing differences between the treatment and control groups, we now add and subtract a further term, $\mathrm{E}\left[Y_i^C|T\right]$, which is the expected outcome of a unit in the treatment group had it not received the program. This gives us the following expression:

$$\mathrm{E}\left[Y_i^T - Y_i^C|T\right] + \mathrm{E}\left[Y_i^C|T\right] - \mathrm{E}\left[Y_i^C|C\right] \quad (3)$$

The first term, $\mathrm{E}\left[Y_i^T - Y_i^C|T\right]$, represents the expected effect of the program on those units that received the program (effect of treatment on the treated) and is the effect that program evaluations ordinarily purport to estimate. The second term, $\mathrm{E}\left[Y_i^C|T\right] - \mathrm{E}\left[Y_i^C|C\right]$, represents the expected difference in outcomes between those in the treatment group and those in the control group had neither been actually assigned the program. This is the selection bias. Since $\mathrm{E}\left[Y_i^C|T\right]$ is not observed, it is impossible to assess the magnitude or direction of the selection bias. Moreover, it is impossible to disentangle the selection bias, $\mathrm{E}\left[Y_i^C|T\right] - \mathrm{E}\left[Y_i^C|C\right]$, from the treatment effect, $\mathrm{E}\left[Y_i^T - Y_i^C|T\right]$.

The problem of selection bias arises from the method by which the treatment and control groups are selected. Depending on the characteristics of the selection process, and specifically, the characteristics used to select units for treatment from a population of 'candidate' units, selection bias may result in the over-estimation of program effects or the under-estimation of program effects. Two examples are provided below:

- A common source of selection bias in development program arises when units are selected from a population of 'candidates' to receive a program based on their relative need – for example, poverty level. Selection bias here arises because, in the absence of the program, it would not be expected that the outcomes of interest in the treatment group of impoverished villages, $\left(E\left[Y_i^C|T\right]\right)$, would match those of the control group of less impoverished villages, $\left(E\left[Y_i^C|C\right]\right)$. Assuming our outcome of interest is some measure of village-level poverty, there will be a negative selection bias on this outcome owing to the pre-existing differences between treatment and control groups, $\left(E\left[Y_i^C|T\right] < E\left[Y_i^C|C\right]\right)$. Thus, the actual effect of the program on the outcome of

[71] Note that the superscript represents the actual assignment of treatment, whereas the conditional statement (the letter after the vertical line) represents the mere assignment to the treatment or control groups.

interest, $\left(E\left[Y_i^T - Y_i^C|T\right]\right)$, will likely be underestimated by the measure that is observed $\left(\hat{E}[Y_i^T|T] - \hat{E}\left[Y_i^C|C\right]\right)$;

- Alternatively, if units are selected to receive the program by the influence or power of local government representatives or other political actors, the treatment effect will again be biased, but probably in a different direction. In this case, it can be expected that, in the absence of the program, the political influence of the villages that received treatment would have caused them to attract other programs or favorable policies of another kind. As such, we would assume that, in the absence of the program, the treatment group would experience more favorable outcomes of interest than the control group, $\left(E\left[Y_i^C|T\right] > E\left[Y_i^C|C\right]\right)$, and that the estimated treatment effect, $\left(\hat{E}\left[Y_i^T|T\right] - \hat{E}\left[Y_i^C|C\right]\right)$, would overestimate the actual effect of the program, $\left(E\left[Y_i^T - Y_i^C|T\right]\right)$.

Unless the expectation of average outcomes across the treatment and control groups is identical, it is impossible to disentangle selection bias from the treatment effect, $\left(E\left[Y_i^T - Y_i^C|T\right]\right)$, and arrive at a clean estimate of the impact of the program. The only reliable means of eliminating selection bias is to randomly assign the program across a pool of potential candidates to receive treatment, with unselected candidates being assigned to the 'control group'.[72] As the control and treatment groups are statistically balanced, $\left(\mathrm{E}\left[Y_i^C|T\right] = \mathrm{E}\left[Y_i^C|C\right]\right)$, provided the treatment effect for each unit does not depend on the treatment status of any other units, [73] the following holds:

$$\mathrm{E}\left[Y_i^T - Y_i^C|T\right] + \mathrm{E}\left[Y_i^C|T\right] - \mathrm{E}\left[Y_i^C|C\right] \quad (4)$$

$$= \mathrm{E}\left[Y_i^T - Y_i^C|T\right] \quad (5)$$

$$= \mathrm{E}\left[Y_i^T - Y_i^C\right] \quad (6)$$

That is, the average effect of the program can be correctly estimated by comparing the average outcomes in the units affect by the program and the units not affected by the program. The regression analog that can be used to estimate this effect is:

[72] Econometrics and statistics have long attempted to eliminate the impact of selection biases on estimated effects, by controlling for differences in covariates between treated and untreated units in the case of econometrics, or composing artificial control groups selected to provide statistical balance with units assigned the treatment. A large literature has evolved to assess the accuracy of these measures in correcting selection biases, with the general conclusion being that these 'retrospective' methods are ordinarily an unreliable means of correcting for selection biases and especially so when the method of selection is not well defined or incorporates qualitative or other unmeasured criteria. For instance, (Duflo & Kremer, Use of Randomization in the Evaluation of Development Effectiveness, 2003) report that retrospective techniques tend to "contain large and unknown biases resulting from specification errors". Comparisons of randomized program evaluations and those conducted through best-practice retrospective procedures generally reveal large discrepancies in reported results. Substantial differences between estimates derived from prospective evaluations and estimates from retrospective analyses have arisen in studies of textbooks and flip charts in Kenyan schools (Glewwe, Kremer, Moulin, & Zitzewitz, 2004), de-worming programs in Kenyan schools (Miguel & Kremer, Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities, 2004), and the impact of social networks on take-up of de-worming drugs (Miguel & Kremer, Social Networks and Learning About Health in Kenya, 2003). For a review of the literature, see (Duflo, Glennerster, & Kremer, Using Randomization in Development Economics Research: A Toolkit, 2006), pp. 11 - 17.

[73] For further discussion the Stable Unit Value Treatment Assumption, see (Angrist, Imbens, & Rubin, 1996)

$$Y_i = \alpha + \beta T_i + \varepsilon_i \quad (7)$$

where T_i is a dummy variable that equals one for units affected by the program and zero otherwise. Ordinary list squares regression produces, $\beta_{OLS} = \hat{E}(Y_i|T) - \hat{E}(Y_i|C)$.

Treatment Assignment Mechanism

In order to ensure the estimated impacts of NSP are not contaminated by selection biases, the treatment mechanism within the 10 sample districts was modified to ensure that all 500 sample villages had an equal probability – exactly 50 percent – of being assigned to participate in NSP.[74] In addition, to improve statistical balance between villages in the control and treatment and to reduce the probability of the integrity of the research design being contaminated by attrition in the sample, a special randomization procedure was adopted whereby 25 matched-pairs of sample villages in each district were formed and then one village in each pair randomly selected to receive the program. The rationale for, and details of, this approach are described below.

The classical method of randomizing program assignment is to perform the statistical equivalent of drawing names from a hat. Provided the sample of 'candidate' units is large enough, this approach ensures balance between covariates in the treatment and control groups, thereby effectively eliminating any pre-existing differences between sample units that receive the program and sample units that don't receive the program. However, in finite samples there is always a possibility that balance of covariates might not be attained. In addition if there is imperfect compliance with the treatment assignments – for example, if a few of the units assigned to receive treatment are denied the program, or if some of the units assigned to the control group instead receive the program – or if some of the units are not able to surveyed during later stages of the data collection process, the randomization effectively fails and concerns of selection bias may contaminate estimated effects.

The problem of imperfect compliance can be dealt with Intention-to-Treat (ITT) estimation. According to this approach, the actual treatment status of a unit is instrumented by the treatment status assigned during randomization, which ensures that imperfect complience does not bias the results.[75] Problems resulting from sample attrition, however, cannot be addressed by employing ITT estimates.[76] Given the various political and security challenges presently confronting Afghanistan, there is a relatively high probability of the study encountering instances of attrition. In order to limit

[74] As noted by (Gakidou, et al., 2007), "This design makes it possible to base inferences on a simple difference in means between the two groups, since the observed and unobserved characteristics of the control and treated clusters are the same, at least on average. Randomization, then, makes it possible to avoid resorting to the usual model-dependent regression adjustments that are required in observational studies."

[75] (Duflo, Glennerster, & Kremer, Using Randomization in Development Economics Research: A Toolkit, 2006)

[76] According to (Gakidou, et al., 2007), "if even one cluster is lost - due to political intervention, measurement errors, incorrect randomization, or for any other reason - we would then no longer be guaranteed that the treated and control groups are comparable on average, and the benefits of randomization would be lost. Any loss of observations in a classical randomization study can thus result in imbalance between the groups, which can generate bias. For example, the PROGRESA evaluation described above used classical randomization and had some loss of observations. Although empirical evidence in that study did "not indicate any systematic differences" between the treated and control groups on the observed variables, the randomization no longer guarantees that any unobserved variables must be similarly balanced on average across the groups. (Behrman & Todd, 1999)"

the impact of such instances on the integrity of the study, the evaluation team opted to adopt a matched-pair randomization design.

A simple description of the matched-pair randomization design is provided by (Gakidou, et al., 2007):

> *In matched pair randomization, we first select pairs of* [sample units] *that are matched, or at least as similar as possible, on a large set of available background characteristics. Then we randomly choose one of the two* [sample units] *within each pair, by flipping a coin, to receive treatment and the other to be the control. The result of this process is exact balance between the entire treated and control groups of* [sample units] *on all variables included in the matching and for which exact matches among the* [sample units] *are available, or near matches otherwise. Variables not matched on are balanced by randomization and therefore only match on average.* (p. 14 – 15)

The matched-pair randomization design has a number of advantages over classical randomization.[77] It improves balance on covariates, which in turn increases the efficiency of estimation, the power of hypothesis tests, and reduces the required sample size for fixed precision or power.[78] Crucially, the matched-pair randomization design also can preclude selection bias in the event of attrition if the attrition is related to one or more variables included in the matching exercise. In this case, the matched-pair containing the offending unit can be dropped from the analysis and the "set of all remaining pairs in the study would still be as balanced . . . as the original full data set."[79] Finally, matched-pair randomization allows correct estimation of the program effect for a given sub-sample of villages, which can provide invaluable information about how program impacts are affected by underlying conditions.

An additional concern which impacted on the design of the treatment assignment mechanism was the possibility of spillovers between units which may cause violations of the Stable Unit Treatment Value Assumption (SUTVA). SUTVA stipulates that the potential outcomes for each individual unit must be independent of the treatment group status of other individual units.[80] In the event of 'positive' spillovers from treatment to control units, the estimated treatment effect, $\hat{E}\left[Y_i^T - Y_i^C | T\right]$, will be biased downward, making it more difficult to identify a treatment effect even if one exists. On the other hand, 'negative' spillovers from treatment to control units will bias the estimated treatment effect upwards, leading to a potentially false identification of program effects.

To mitigate the potential for spillovers between treated and control units, a stipulation was introduced that villages located within a kilometer of one another must be assigned to the same treatment status. Unfortunately, however, the efficacy of this measure was limited by inaccuracies in the GPS coordinates used to determine distances between sample villages, by a coding error which

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[77] This technique has been formerly used and referenced in (Donner & Klar, 2000; Greevy, Lu, Silber, & Rosenbaum, 2004; Gakidou, et al., 2007)

[78] (Greevy, Lu, Silber, & Rosenbaum, 2004), p. 264, cited in (Gakidou, et al., 2007), p. 15

[79] (Gakidou, et al., 2007), p. 15. However, (Gakidou, et al., 2007) note that "Selection bias might still occur under this design if, for political or other reasons, [sample units] were lost after the start of the study for reasons both unrelated to our matched variables and related to the treatment assignment, or by selecting on the casual effect." (p. 15)

[80] (Angrist, Imbens, & Rubin, 1996), cited in (Duflo, Glennerster, & Kremer, Using Randomization in Development Economics Research: A Toolkit, 2006)

affected three districts, and the infeasibility of completing implementing the procedure in two other districts where villages were closely clustered together.

To form matched-pairs, an optimal greedy matching algorithm, based on Mahalanobis distance between the observations, was employed.[81] The *optimal greedy* matching procedure first calculates the Mahalanobis distance between every feasible pair of communities in the district and then selects the pair of villages with the least Mahalanobis distance as a matched-pair, with the constraint that the pairs should not belong to the same cluster.[82] This selected pair is then removed from the pool of feasible pairs. These steps are then repeated until all the communities are matched in pairs.

Ideally, the matching algorithm would have utilized data from the baseline survey. However, although the assignment to treatment was done after the commencement of the baseline survey, the time pressures faced by FPs for mobilizing NSP sample villages meant it was impractical to wait until the baseline survey data had been processed to make the assignments and provide the list of NSP sample villages to FPs. Thus, the matching algorithm employed pre-existing village-level data obtained from the Central Statistics Office (CSO). The code of the matching algorithm is provided in Appendix V.

The complete treatment assignment mechanism proceeded along seven stages, which are described in detail below:

1. **Clusters:** To minimize potential for spillovers between treated and untreated units, villages located within one kilometre of each other were grouped in clusters. Of the 500 sample villages, 107 were assigned to 41 clusters. The number of villages in each cluster was ranging from 2 to 6. All of the districts had at least one cluster of villages, with the largest number of clusters being 10 in Khost Wa Firing district in Baghlan province and 8 in Sherzad district in Nangarhar.[83] Maps of clustered and un-clustered villages in each of the 10 sample districts are presented in Appendix VI.[84]

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[81] Mahalanobis distance is defined as $d = \sqrt{(\overrightarrow{x_1} - \overrightarrow{x_2})V^{-1}(\overrightarrow{x_1} - \overrightarrow{x_2})}$, where $\overrightarrow{x_1}$ is a vector of characteristics of community i, and V is the covariance matrix of corresponding characteristics. Intuitively, we first calculate the difference in each of the underlying characteristics separately and then combine these differences, giving more weight to those characteristics that have the lowest variance and covariance with other characteristics. Taking variance into account makes this measure independent of the units of measurement, whereas taking into account covariance decreases individual weights for the characteristics that usually go hand in hand. Because of the significant heterogeneity among districts, a covariance matrix was computed for each district separately, using the data for all communities in the district for which the corresponding data was available, not only those that were included in the evaluation study.

[82] This procedure differs from *optimal* matching, which selects pairs to minimize the total Mahalanobis distance between each of the pairs. The drawback with *optimal* matching is that any reduction in the sample results in a loss of optimality. On the other hand, matched pairs formed with a *greedy optimal* algorithm are optimal, given the constraints, and retain their optimality even if matched-pairs are lost. As it is anticipated, that some of the matched-pairs will be lost during the course of the study, the decision was made to employ an *optimal greedy* matching procedure.

[83] In three districts (Balkh, Adraskan and Chist e-Sharif), a coding mistake mean that the the assignment of communities to clusters did not correctly reflect the distances between the villages. As a result, for these three districts the clustering restriction was effectively not taken into account, which resulted in the number of clustering restriction violations in these three districts being higher by five. It also put irrelevant constraints during the matching procedure, which slightly damaged the quality of matching. Neither of these two effects is posing any

2. **Matched-Pairs:** In each district, the 50 sample villages were paired into 25 groups of two using an *optimal greedy* matching algorithm which paired villages to ensure similarity based on various background characteristics provided that the villages were not in the same cluster.[85] The following data were used for the matching exercise:[86] (1) number of households [CSO], (2) main language [CSO], (3) distance to nearest river [GIS], (4) distance to district center [CSO], (5) topography type [CSO], (6) type of nearest road [CSO], and (7) existence of primary school in the community [CSO]. Maps of matched-pairs in each of the 10 sample districts are presented in Appendix VII.
3. **Matched-Quadruples:** Using the same procedure as in (2), the 250 pairs of villages were in turn matched into 125 quadruples of villages using Mahalanobis distance between the average of variables for villages in each pair.
4. **Assignment of Treatment:** In each matched-pair, a random number generator was employed to decide which of the two villages would be assigned to participate in NSP and which would be assigned to the control group. In order to minimize the probability of spillovers biasing estimated impacts of NSP, clusters of villages were either all assigned to the treatment group or all assigned to the control group.[87] In total, 250 villages were assigned to the treatment and control groups respectively. Maps of the treatments assigned to villages in each of the 10 sample districts are presented in Appendix VIII.
5. **Assignment of Election Method:** For each village selected to participate in NSP, the method of election was selected using a random number generator, with the alternative election method being assigned to the other treatment village in the matched-quadruple. As with the assignment of treatment, the same election method was assigned to villages in the same cluster. In this manner, 125 villages were assigned to receive ward elections and 125 villages were assigned to receive at-large elections. Maps of the election method assigned to treatment villages in each of the 10 sample districts are presented in Appendix IX.
6. **Assignment of Project Selection Procedure:** For each village selected to participate in NSP, the project selection procedure was selected using a random number generator, with the alternative project selection procedure being assigned to the other treatment village in the matched-quadruple. As with the assignment of treatment and assignment of election method, the same project selection procedure was assigned to villages in the same cluster. In this manner, 125 villages were assigned to receive consultation meetings and 125 villages

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threat to validity of the results, although the presence of clustering restriction violations is likely to increase the strength of the spillover effects in these three districts.

[84] Village locations for the maps in Appendices IV – VIII are provided by GPS coordinates collected during the baseline survey.

[85] The *optimal greedy* matching procedure works by calculating the Mahalanobis distance between every feasible pair of communities in the district. The pair of villages with the least Mahalanobis distance is selected as a matched-pair, with the constraint that the pairs do not belong to the same cluster. This selected pair is then removed from the pool of feasible pairs. the pair and repeat the preceding steps until all the communities are matched in pairs.

[86] Square brackets indicate source of data where CSO indicates the Household Listing Exercise conducted by CSO in 2003 – 05 and GIS indicates that the data was generated by the authors based on available geographic information.

[87] This was achieved by executing an algorithm which, after a village has been assigned a treatment status, assigned all of the other the villages in the same cluster the same treatment status. The other villages in the respective matched-pairs were then assigned the complimentary treatment status.

were assigned to receive referenda. Maps of the project selection procedure assigned to treatment villages in each of the 10 sample districts are presented in Appendix X.

7. **Violations of Clustering Restrictions:** In a few districts, the number of clustered communities and pattern of matching precluded the co-assignment of clustered villages to the same treatment and sub-treatment status.[88] The procedure described above insures that clustering restriction is not violated if there are no cycling of matched pairs among the clusters. For those districts for which assignment of treatment status without violation of the clustering restriction was not possible, the number of violations was minimized through a simulation approach. Specifically, the procedures described in the preceding steps were repeated ten times for each such district and the assignment that minimized the variation of the treatment status within clustered communities within the district was selected.

According to the above steps, the 500 sample villages were assigned to either the treatment and control group, with those assigned to the treatment group also being assigned an election method and project selection procedure.[89] In order to verify whether the procedures provided statistical balance between the treatment and control groups, mean values for each group are computed for a number of important variables using data from the baseline survey.[90] Table 1 presents these means, as well as their normalized difference.[91] A comparison of the respective means and normalized differences indicates that the treatment assignment mechanism produced very high levels of statistical balance between the treatment and control groups – among the variables listed, the difference between the means of the two groups is always smaller than 6% of the standard deviation.

[88] To understand why this might be the case, consider a situation in which there are three clusters with two villages in each cluster. Suppose a village from cluster 1 being matched with a village from cluster 2, the other village from cluster 2 is matched to a village from cluster 3 and the other village from cluster 3 is matched to the remaining village from cluster 1. If both villages in cluster 1 are assigned to the treatment group, then their matches in the clusters 2 and 3 will be assigned to the control group. Whichever way we assign treatment status to the remaining pair of villages (one in cluster 2 and one in cluster 3), one of them will have to be assigned to the treatment group despite the fact that the other village in that cluster is already assigned to the control group.

[89] For 17 village clusters, (covering 44 villages) the condition of the same treatment status within cluster was violated. In three districts (Khost Wa Firing, Hisarak, and Sherzad) violation was caused by a large number of clustered villages (the number of clusters were 10, 7, and 8, respectively). In the other three districts (Balkh, Adraskan and Chist-e Sharif) violation was caused by the coding mistake described above.

[90] Specifically, this exercise employs data from the male head-of-household questionnaires administered to approximately 5,000 respondents across the 500 sample villages. It is important to note that the matching exercise described in steps 2 and 3 above did not draw on data from the baseline survey, but rather uses data collected a few years earlier in a Household Listing Exercise conducted by the Central Statistics Office (CSO) and geographic variables constructed by the authors.

[91] This is the difference in means divided by the standard deviation of the sample.

Table 5: Statistical Balance between Treatment and Control Groups

Variable	Mean for Treatment Group	Mean for Control Group	Normalized Difference
Number of Households	136.30	148.15	**-0.030**
Dari-speaking	0.678	0.665	**0.027**
No Education	0.690	0.688	**0.005**
Access to Electricity	0.141	0.130	**0.033**
Dispute in Village	0.343	0.359	**-0.034**
Borrowed Money Last Year	0.461	0.475	**-0.029**
No Access to Medical Services	0.120	0.120	**0.001**
Attended Meeting of Village Shura	0.309	0.295	**0.030**
Expenditures on Wedding (AFA)	18,460.60	17,167.27	**0.007**
Women should be Members of Shura	0.428	0.403	**0.051**

IV.3. Design Limitations and Potential Complications

The design of the study reflects various constraints imposed by the security situation and political context in Afghanistan, by the progress of the NSP program at the time of the launch of the baseline survey, and by the limitations of modern econometrics and statistics. These constraints have, in some cases, imposed a number of limitations on what can be reasonably expected from the study, and in others, raise the potential for complications which could affect the study's validity. These issues, and proposed mitigation measures, are discussed below.

The process of sample selection was not random or representative, but rather was dictated by a series of constraints imposed by the progress of the NSP program at the time of the study's design, as well by the political and security context in Afghanistan. Issues pertaining to the representatives of the sample district are discussed first, followed by the representatives of the sample villages:

- **Representativeness of Sample Districts**: The 10 sample districts were not selected to provide a representative sample of Afghanistan. Indeed, the criteria that were used to select the sample districts meant that the sample districts are potentially a relatively special subset of the 398 districts in Afghanistan. What is important for the study, however, and particularly the study's goal of providing an estimate of the impact of NSP across Afghanistan, is whether the impact of NSP in the sample districts is likely to be significantly different than the impact of NSP in other districts of the country. This will not be able to be answered until much more is known about the process of program implementation in the sample districts and how this has compared with that in other districts. One critical, but unavoidable, limitation of the selection of the sample districts was the failure to cover the southern region. At the time of the planning for the baseline survey, security conditions dictated that prolonged enumeration activities, as would be required for the baseline survey, could not be undertaken without exposing enumerators to extreme risk of kidnap or execution. As a result of this omission, the study will not be able provide evidence on the impacts of the NSP in southern provinces, such as

Kandahar or Helmand. However, as noted above, the 10 sample districts did include both a number of Pashtun-dominated districts and a number of districts where the security situation is considered volatile or where cultivation of poppy or other narcotics is significant.

- **Representativeness of Sample Villages**: In order to improve the acceptability of the randomization procedure to both participating FPs and local authorities, the evaluation team relinquished the responsibility for selecting the sample villages. In addition, FPs selected an additional 15 villages which would not be included in the study and which could be prioritized for NSP participation. This selection procedure raises a number of concerns about whether the sample villages are adequately representative of the population of villages in the sample districts. Indeed, from examining the locations of the sample villages and the wider population of villages (see Appendix IV), it appears that, in general, the sample villages are located closer to district centers and/or roads than unselected members of the population of villages. Thus, if is the case that the impact of NSP in the sample villages differ significantly from the impact of NSP in the unselected members of the population of villages and the 15 priority villages, the impacts estimated by this study would not provide an accurate estimate of the impact of NSP in the population of villages in the sample districts.[92]

Just as the sample selection procedure was neither random nor representative, neither was the process by which the six FPs were assigned to the sample districts. While this raises concerns about generalizability, there also exists a related concern about the potential for diversity in implementation between the different FPs implementing NSP in the sample districts:

- **Diversity in Implementation**: It is expected that a reasonable amount of variation will be present in the manner in which the NSP program, and the sub-treatment interventions, are implemented in different districts. It is also recognized that, in some cases, FPs will 'bundle' other development interventions with NSP, creating a further source of diversity and complicating the identification of the impact of the NSP *per se*. The study will thus estimate the average impact of the NSP, and any additional 'bundled' interventions, as implemented by the 7 participating FPs in their respective districts. Due to the fact that the number of sample districts is small and the method of FP assignment is non-random, the study will not be able to assess the relative impacts of different FPs on the effectiveness of program implementation.

In order to provide an accurate description of what exactly the study is estimating the impact of, an intensive monitoring program has been designed to report how NSP is being implemented in each

[92] This in turn raises questions, however, about what should constitute the population of villages. For example, some of the villages which were not selected for inclusion in the 50 sample villages were ineligible for independent participation in NSP due to their small size. A number of other villages appear to be extremely difficult to access, raising concerns about whether FPs would be willing or able to mobilize such villages even in the event that full coverage of the district had been mandated. Finally, some of the unselected villages may have been insecure or unwilling to participate in NSP, again raising questions of whether, in the absence of the study and the presence of full coverage, they would have participated in NSP anyway. As such, the 'population' of villages is something that can be quite difficult to define for evaluations of programs such as NSP.

of the sample districts at each stage of the process.[93] By comparing these reports with those held by the NSP office for other FPs and other regions of the country, the evaluation team should be able to discern whether implementation by any of the participating FPs in any of the sample districts has differed from implementation by other FPs or in other parts of the country.

As with any randomized study, a major concern is the potential for attrition and widespread non-compliance. Although the treatment assignment mechanism was designed specifically with this possibility in mind, the quality of inferences could still potentially be affected by specific forms of attrition and non-compliance:

- **Attrition**: Although the matched-pair randomization design preserves the integrity of the experimental design if instances of attrition are related to set of variables included in the matching algorithm, it provides no such protection from attrition which occurs for reasons related to the treatment assignment but which are independent to the variables included in the matching algorithm. That is to say, selection bias could occur if a village had to be removed from the sample due to deterioration in security or if political pressures forced a village in the control group to be included among those participating in NSP.
- **Non-Compliance**: At the time of writing, a number of instances of non-compliance have arisen, although almost all of these have been caused by villages in the treatment group being too small to participate in NSP independently. As the number of households was a variable incorporated into the matching algorithm, it is thus hoped that these instances of non-compliance will not result in the introduction of selection bias into the estimates. In addition, the evaluation team are aware of at least one instance where the incorrect sub-treatment intervention was applied. After some investigation, the evaluation team were assured that this non-compliance arose due to a simple mistake and so therefore should not taint the final estimates. In any event, ITT estimates will provide a valid measure of the impact of the program and sub-treatment interventions.

IV.4. Data Collection Procedures

Data for the study is to be collected through two different sets of instruments: (1) Household and Focus Group Surveys; and (2) Monitoring Exercises.[94] These are discussed in turn below:

Household and Focus Group Surveys

The core collection of data for the outcome indicators is structured around a series of longitudinal surveys administered in the 500 sample villages over two or more years. Four survey instruments have thus far been designed specifically for the study:[95]

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[93] Specifically, the evaluation team has organized CDC elections and vote-tallying procedures to be observed and have administered questionnaires to villagers during CDC elections and project selection procedures. In addition, it is proposed that the process of project implementation will be monitored by qualified engineers. Participating FPs are also required to submit a number of reporting documents following the completion of the election and project selection.

[94] More details on the data and field surveys, including information on falsification and re-interviewing currently under way, can be found in Appendix I.

[95] All survey instruments are available for download at: http://www.beath.org/NSP-IE

1. **Male Head-of-Household Questionnaire (MHH-Q)**: The MHH-Q is administered to 10 randomly-selected male heads-of-household in each sample village. The questionnaire collects information on household consumption, production, assets, debt as well as attitudes towards the village's existing leadership; community trust; household political participation; attitudes towards women; and preferences for village projects. The survey took between 30 and 45 minutes to administer;
2. **Male Focus Group Questionnaire (MFG-Q)**: The MFG-Q is administered to a group of between 6 and 9 men, who should be village leaders and/or members of the local *shura*. The questionnaire is designed to collect information about the village infrastructure and availability of services, local price levels, as well as elite perceptions of village trust, community needs, and preferences for community projects. The survey took between 1.5 and 2 hours to administer;
3. **Female Focus Group Questionnaire (FFG-Q)**: The FFG-Q is administered to a group of between 6 and 9 women, who are expected to be wives or other relatives of the village leaders and/or members of the local *shura*. This questionnaire covers similar issues to the MFG-Q and takes a similar amount of time to administer;
4. **Female Individual Questionnaire (FI-Q)**: The FI-Q is administered to the same participants as the female focus group but is conducted on a one-to-one basis. The questionnaire collects information concerning consumption; attitudes towards the authority; village trust; and preferences for village projects. The survey takes between 20 and 30 minutes to administer.

The intention is to administer the above surveys to the same individuals at three stages across a two year-span, providing a rich panel (or longitudinal) dataset for the sample villages. Three rounds of survey activities are planned: a baseline survey was administered over August-September 2007 before NSP activities commenced in any of the sample districts; a first follow-up survey is planned for fall 2008 following partial completion of program activities, and a second follow-up survey is planned for fall 2009, at which time it is expected that program activities will have been concluded in the 250 NSP sample villages.

The veracity of data collected during each of the survey rounds is to be independently assessed by more limited post-enumeration "re-surveys" of subjects.

Monitoring of Program Implementation

The goal of the monitoring exercises is to provide a documentation of the process by which the NSP is implemented in sample villages, to verify the implementation of assigned variations in the sub-treatment interventions (STIs), to collect data required to evaluate hypotheses pertaining to the impact of STI variation, and to provide an assessment of community involvement and CDC performance at various points during the implementation of NSP.

The monitoring exercises that are currently in operation or are planned are the following:

1. **Election Monitoring (E-M)**: Election monitoring exercises are focused on the administration of "Post-Vote Interviews" to between 10 and 15 voters. Post-Vote Interviews ask questions to determine the level of knowledge of the voter about the CDC election process and the NSP generally. In addition, election monitors complete "Polling Station Reports" detailing the location and facilities of each polling station, to supervise the vote counting process, and to complete an "Election Report" to assess the

integrity of the election. In general, election monitoring activities are conducted in 12 of the 25 NSP sample villages in each district;

2. **Project Selection Procedure Monitoring (SPSP-M)**: Project selection procedure monitoring exercises are similar to the election monitoring exercises. A Post-Vote or Post-Meeting Interview is assessed to villagers following their participation in the project selection procedure, which aim to determine villagers knowledge of, and level of satisfaction with, the project selection procedure. In addition, project selection procedure monitors are required to complete "Polling Station Reports" and monitor the vote counting process in villages assigned to a referendum. In all villages, monitors are required to complete a report at the end of the day assessing the integrity of the process. In general, project selection activities are conducted in 12 of the 25 NSP sample villages in each district;
3. **Project Management Monitoring (PM-M)** [*Proposed*]: The purpose of project management monitoring is to assess the effectiveness of project management, provided by the CDC, the village community, and/or independent contractors, and to also assess the level of knowledge of members of the village community about the project and to gauge the level of participation among members of the CDC and of the village community in project supervision;
4. **Project Completion Assessment (PCA)** [*Proposed*]: The purpose of the project completion assessment is to assess the quality and functionality of completed projects and quantify the benefits provided to the village community by the project. For engineering and other technical projects, the PCA would be undertaken by qualified engineers.

The monitoring exercises are structured around the critical stages of NSP implementation and, as such and unlike the household and focus group surveys, are staggered to reflect the schedules of FPs operating in different sample districts.

V. Concluding Remarks

The purpose of this paper was to provide an overview of the goals, hypotheses, methodology, and data collection processes for a major on-going randomized evaluation of the National Solidarity Programme (NSP) in Afghanistan. The study covers 500 sample villages located in 10 sample districts located in six provinces in Afghanistan and involves seven NGOs participating in the study. The central objective of the study is to provide a precise, rigorous, and unbiased estimate of the impact of the NSP on the economic and social welfare of Afghan villagers and the institutions and governance structures of rural Afghanistan. A secondary objective of the study is to estimate the impact of variance in two sub-treatment interventions, one pertaining to the method of CDC election and the other to the procedure used to select village projects for NSP funding. To paraphrase the concluding remarks of (Gakidou, et al., 2007), "We do not know how [NSP], or its many components, will be evaluated in the end, but we are certain that thousands of national and regional governments around the world, as well as their citizens, would greatly benefit by following

the lead of the [Afghan] government and enabling social scientists to conduct serious, arms-length, dispassionate, scientific evaluations of governmental programs."[96]

[96] (Gakidou, et al., 2007), p. 27

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Appendix I – Data Collection Procedures

Male Head-of-Household Questionnaire (MHH-Q)

The household survey was designed to survey 10 male heads-of-household per village. In order to select participants, enumerators were instructed, upon arrival in a sample village, to ascertain the total number of dwellings, and from this, calculate a sampling interval, k, by dividing the number of dwellings in the village by 10. Enumerators were then to select an arbitrary starting point and, from this, to skip k dwellings before approaching a dwelling and inviting the resident male head-of-household to participate in the survey.[97] Enumerators were instructed to repeat this procedure until a total of 10 male head-of-household questionnaires had been administered in the village.

This systematic sampling approach was chosen due to the absence of a list of households from which a sampling frame could be constructed, the relative simplicity of the procedure, and the fact that the procedure offers to provide a random selection in the absence of any expected periodicity which might otherwise bias the sample. In some of the small villages interviewers could not locate ten heads-of-households or were not able to complete 10 interviews during the time available. As a result, the total number of male head-of-household questionnaires administered during the baseline survey was 4,895 across the 500 sample villages.

Male Focus Group Questionnaire (MFG-Q)

The Male Focus Group questionnaire was designed to be administered to between 6 and 9 participants. Enumerators were instructed to seek participation of the village leaders and/or members of the local *shura* or *jirga*. Where the village had a functional *shura* or *jirga*, enumerators were instructed to request the participation of all of the regular members of the body in the focus group. In cases where the village shared a *shura* or *jirga* with a neighboring village, enumerators were instructed to request the involvement of all members residing in the sample village and proximate areas. If no *shura* or *jirga* existed in the sample village, enumerators were instructed to convene a meeting of the village headman and other local power-holders residing in the village such as the controller of the local water canal (*Mirab* or *Khadadar*), the major landowners (*Khan*, *Zamindar*, *Beg*, *Sardar*, *Nawab*, or *Arbab*), the religious leaders (*Ulema*, *Mullah*, *Mullawi*, *Talib*, *Qazi*, *Mukhi*, *Mukhiyana*), commander (*Qumandan* or *Mujahed*), and local tribal elders ('White Beards'). The participants were in turn asked during the focus group whether any important village leaders were not participating in the focus group and, if so, why they were not participating. The total number of individuals which participated in the male focus groups during the baseline survey was 3,962.

Female Focus Group Questionnaire (FFG-Q) and Female Individual Questionnaire (FI-Q)

The Female Focus Group Questionnaire was designed to be administered to between 6 and 9 participants. Given the sensitivities involved in interviewing women in rural Afghanistan, female enumerators conducting the focus groups and subsequent interviews were given discretion to decide the most appropriate means of selecting participants. It is expected, however, that the participants will be wives or other relatives of the village leaders.[98] Following the completion of the Female Focus Group, the Female Individual Questionnaire was individually administered to participants.

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[97] No monetary inducement was offered to participate and subjects were free to decline to participate in the interview if they so desired.

The total number of individuals which participated in the female focus groups during the baseline survey was 3,407 in 493 villages. The Female Individual Questionnaire was administered to 3,515 women in 495 villages.

Monitoring and Re-Interviewing

To ensure the quality of the baseline data, supervisors were monitoring the enumerators work throughout the data collection process, with one supervisor assigned for every team of three enumerators. To further verify the integrity of the data collected, re-interviews have been conducted over a randomly selected sample comprising 10% of the male heads-of-household interviewed during the baseline survey. This re-interviewing is being conducted in 120 communities across 10 districts in a period of 2-6 months following the conclusion of the baseline survey and will seek to verify the work of all 60 male enumerators which participated in the baseline survey.

[98] Since our project is highly concerned with political participation, we expect these women to be the most likely to hold such posts after the introduction of the NSP and they are therefore the women we were interested in sampling.

Appendix II – Sources of Information for Variables in Section III

The following tables provide a listing of some of the questions administered during the baseline survey and subsequent data collection exercises which are to be employed in the testing of hypotheses outlined in Section III above. A rough English translation (from Dari) of each relevant question is provided, followed by the instrument in which the question was administered (MHH: Male Head-of-Household Questionnaire; MFG: Male Focus Group Questionnaire; FFG: Female Focus Group Questionnaire; and FI: Female Individual Questionnaire) and the question number.

Economic and Social Welfare

Access to Services	
Water	- **What is the main source of drinking water?** (*MHH-2.01, MFG-3.16, FFG-2.21*) - **How long does it take (on foot) to get to the water source, take water and come back?** (*MHH-2.05, FFG-2.24*) - **How often do you need to get water from the source?** (*MHH-2.06, FFG-2.25*)
Electricity	- **Did your family have access to electricity last year?** (*MHH-2.07, MFG-3.19-20*) - **What is your primary source of electricity? For example diesel generator, water generator, solar system, battery or something else?** (*MHH-2.08, MFG-3.21*) - **Does this generator belong to your household, is it shared with other households, or does it belong to the entire village?** (*MHH-2.09, MFG-3.22*) - **How many days on average did your house have electricity during the last 30 days?** (*MHH-2.10*) - **How many hours per day did your house have electricity on average during the last 30 days?** (*MHH 2.11*) - **Do you pay for electricity?** (*MHH-2.12, MFG-3.23*) - **How much money did you pay for electricity in the last 30 days?** (*MHH-2.13*) - **As compared to this time last year have this village's household access to electricity increased, decreased or remained the same?** (*MHH-2.14*)
Roads	- **Can vehicles travel across the nearest road to your village throughout the year including winter?** (*MFG-3.27*) - **Which roads where blocked during the past 12 months (not suitable for traveling)?** (*MFG-3.28*)
Education	- **In comparison with the last year has the number of children going to school in your village increased, decreased or stayed the same?** (*MHH-2.23, MFG-3.08, 3.10, FFG-2.10-12*) - **Are there vocational training or literacy courses in your village?** (*MHH-4.22, MFG-5.13, FFG-3.06*) - **What are the main subjects of these courses?** (*MHH-4.23, MFG-5.14, FFG-3.07*) - **Are these courses just for men or women, or for both men and women?** (*MHH-4.24, MFG-5.15, FFG-3.08*) - **What is the main reason for women not being able to participate in these courses?** (*MHH-4.25, MFG-5.16, FFG-3.09*)

Consumption	
Monthly Expenditure	- **What was your household's total expenditure for each of the items below in the last 30 days?** **Food** (*MHH-6.13*) **Transportation Fares** (*MHH-6.14*) **Shoes and Clothes** (*MHH-6.15*) **Telephone Cost** (*MHH-6.16*) **Fuel for Car or Motorbike** (*MHH-6.17*)
Annual Expenditure	- **What was the total expenditure of your household on the following items in the last 12 months?** **Taxes** (*MHH-6.18*) **Construction or Repair of the House** (*MHH-6.19*) **Medicine** (*MHH-6.20*) **Doctor and Hospital Fees** (*MHH-6.21*) **Education Fees** (*MHH-6.22*) **Repair and Maintenance of the Car** (*MHH-6.23*) **Penalty and Loan Payments** (*MHH-6.24*) **Weddings** (*MHH-6.25*) **Funerals** (*MHH-6.26*) **Hajj** (*MHH-6.27*) **Traditional Annual Festivals** (*MHH-6.28*) **Charity and Relief** (*MHH-6.29*)
General	- **How many times did you face problems when supplying food for your family last year?** (*MHH-6.42*) - **Have a member of your family gone on the Hajj in the last five years?** (*MHH-6.43*) - **If you compare your household condition with last year, has your household condition improved, remained the same or deteriorated?** (*MHH-8.14*)
Negative Shocks	- **Has your household faced one of the following problems and been affected by it in the last 12 months?** **Reduction in agriculture harvest** (*MHH-6.30*) **War and insecurity** (*MHH-6.31*) **Illness of a member of the household** (*MHH-6.32*) **Food price inflation** (*MHH-6.33*) **Reduction in the sale price of agriculture products** (*MHH-6.34*) **Shortage of drinking water** (*MHH-6.35*) **Return of too many refugees** (*MHH-6.36*) **Redundancy of a household member** (*MHH-6.37*) **Salary reduction of a household member** (*MHH-6.38*) **Theft or loss of land and house** (*MHH-6.39*) **Theft or loss of livestock** (*MHH-6.40*) **Theft or loss of house and other properties** (*MHH-6.41*)

Assets	
Dwelling	- **Physical condition of dwelling** (*MHH-0.18*) - **Number of rooms in dwelling** (*MHH-0.19*)

Material Possessions	- **Does your household have the following items (in working condition)?** **Watch or Clock** (*MHH-6.44*) **Home-made Carpet** (*MHH-6.45*) **Rug, Strip Cotton Carpet, Thick Woolen Carpet, Floor Covering** (*MHH-6.46*) **Fridge** (*MHH-6.47*) **Radio** (*MHH-6.48*) **Mobile Phone** (*MHH-6.49*) **Television** (*MHH-6.50*) **Carpet Weaving Hoop** (*MHH-6.51*) **Generator** (*MHH-6.52*) **Wheelbarrow** (*MHH-6.53*) **Bicycle** (*MHH-6.54*) **Motorbike** (*MHH-6.55*) **Tractor** (*MHH-6.56*) **Plow** (*MHH-6.57*) **Car** (*MHH-6.58*) **Truck** (*MHH-6.59*)
Livestock Ownership	- **Does your household have livestock or chickens** (*MHH-6.60*) - **Which one of the following livestock do you have?** **Cow** (*MHH-6.61*) **Horse** (*MHH-6.62*) **Donkey** (*MHH-6.63*) **Goat** (*MHH-6.64*) **Sheep** (*MHH-6.65*) **Birds / Chicken** (*MHH-6.66*) **Camel** (*MHH-6.67*)

Production	
Cash-for-Work	- **Were you or a member of your family involved in activities for money last year?** (*MHH-4.18*, *FFG-4.05*) - **Since last year, how many days were members of your family involved in money for work projects?** (*MHH-4.19*) - **How much was the daily wages for this work?** (*MHH-4.20*) - **What was the reason why no member of your household has been participating in the money for work activities since last year?** (*MHH-4.21*)
Major Income Generating Activities	- **What are the three most important income activity of your household?** (*MHH-6.01,.05,.09, MFG-7.01,.02,.03; , FFG-4.16*) - **How much of your household total income did this income activity make last year?** (*MHH-6.02,.06,.10*) - **In which season of the year did you make the income generated from this activity?** (*MHH-6.03,.07,.11*) - **How many afghanis did you make in a month on average from this activity?** (*MHH-6.04,.08,.12*)
Agricultural Production	- **Do you or a member of your family have access to a type of agriculture land or an orchard?** (*MHH-6.68*) - **How many jerebs of irrigated land, rain fed land or orchid did your family have access to?** *(MHH-6.69*) - **What are the three major agriculture products that you grew last summer?** (*MHH-6.70,.71,.72*, *MFG-*

	7.04,.05,.06) - **What are the three major agriculture products that you grew last winter?** (*MHH-6.73,.74,.75*) - **What are the main sources of your land irrigation in the summer?** (*MHH-6.76*) - **What are the main sources of land irrigation in the winter?** (*MHH-6.77*) - **Have you done these works in the last season of harvest?** **Farmed the land** (*MHH-6.78*) **Leased in the land** (*MHH-6.79*) **Franchised in the land** (*MHH-6.80*) **Farmed out the land** (*MHH-6.81*) **Leased out the land** (*MHH-6.82*) **Franchised out the land** (*MHH-6.83*) - **How many jerebs of your irrigated land, rain-fed land or the orchard that your household has access to were not cultivated during the last spring?** (*MHH-6.84*) - **What was the main reason for not growing this land?** (*MHH-6.85*)
Agricultural Markets	- **Did you sell the harvest you gained in the last season?** (*MHH-6.86*) - **Did you sell the vegetations you received in the last harvest?** (*MHH-6.87*) - **How much money did you make from selling the last season vegetations?** (*MHH-6.88*)

Borrowing	
	- **Have you or any member of your family received a loan from your friends, family, boss, bank, NGO, businessman or other sources in the last 12 months that should have been reimbursed?** (*MHH-7.01*) - **Why did you get this loan?** (*MHH-7.02*) - **Why was it not possible to get a loan?** (*MHH-7.04*) - **Was this loan in cash or goods?** (*MHH-7.05*) - **Should the reimbursement of this loan be in cash or goods?** (*MHH-7.06*) - **What was the value of your main loan?** (*MHH-7.07*) - **How many months did you have for your main loan reimbursement?** (*MHH-7.08*)

Institutions and Governance

Village Leaders	
Village Leaders	- **What is the name of the person or persons most responsible for making decisions on behalf of the community?** (*MHH-3.01, MFG-4.04, FI-1.02*) - **Does this person [OR PEOPLE] hold any other positions or title? For example, are they the Malik or Arbab, the Mirab, the Mullah, the Mullawi, the Qumandan, or do they hold some title or responsibility?** (*MHH-3.02, MFG-4.05, FI-1.03*)
Positions of Local Authority	- **If two or more or members of the village have a hoququi dispute, what is the title or responsibility of the person who usually helps resolve this dispute?** (*MHH-3.03, MFG-4.06, FI-1.04*) - **If a villager needs food or money due to a crop failure or other catastrophe, what is the title of the person in the village who would give them food or money to survive?** (*MHH-3.04, MFG-4.07, FI-1.05)* - **If a villager needs to borrow money for a reason that is not an emergency – for example, to pay for a wedding or other celebration - what is the title of the person in the village who would lend them**

	money? (*MHH-3.05, MFG-4.08, FI-1.06*) - **Who is most responsible for initiating development projects or cash-generating activities in the village? What this person's title or responsibility?** (*MHH-3.06, MFG-4.09, FI-1.07*) - **If the village requires protection due to conflict or attacks by bandits, who is the person who would provide this protection? What is this person's title or responsibility?** *(MHH-3.07, MFG-4.10, FI-1.08*) - **Is there a person who is responsible for providing villagers with access to irrigation or drinking water? What is this person's title or responsibility?** (*MHH-3.08, MFG-4.11, FI-1.09*) - **Who is the person most responsible for making rules for the village?** (*MHH-3.09, MFG-4.12, FI-1.10*)

Female Participation in Governance
- **Do you think women should be village leaders?** (*MHH-3.31, FI-1.32*) - **Do you think women should have their own separate shura?** (*MHH-3.32, FI-1.33*) - **Are women members of the *shura* or do they have a separate council?** (*MFG-4.16*)

Political Participation	
Community Projects	- **Have your or a member of your household cooperated with the project in terms of labor, money and required goods for the project?** (*MHH-4.07*)
Knowledge and Information	- **Who is the President of Afghanistan?** (*MHH-8.03*) - **What is the name of the Member of Parliament representing this area?** (*MHH-8.04*) - **What is your main source of information about national events?** (*MHH-8.08*)
Voting	- **Did you vote in the last parliamentary elections?** (*MHH-8.10*) - **Will you vote in the next parliamentary elections?** (*MHH-8.11*) - **Did you vote in the last presidential election?** (*MHH-8.12*) - **Would you participate in the next presidential elections?** (*MHH-8.13*)

Discontent	
Unjust Acts	- **I'd like you to now think about all the things that the village leaders have done in the past year, both good and bad. Have the village leaders made a decision or done something that you believe was unjust, unfair, not right, or otherwise didn't agree with?** (*MHH-3.24, FI-1.25*) - **What was the thing or things they did which you did not agree with?** (*MHH-3.25*, *FI-1.25*) -**What did the village leaders do that made you not so happy with them?** (*MHH-3.30*, *FI-1.31*)
Satisfaction	- **How happy are you with the work the village leaders do for the community? Happy, neutral, or not happy?** (*MHH-3.29*, *FI-1.30*) - **In your view, would the people mentioned here work for the benefit of all the people in the village, for the benefit of some, or only for their own benefit?** (*MHH-5.07-5.16*) **District Government Authorities** **Provincial Government Authorities** **Central Government Authorities** **Members of Parliament** **President of Afghanistan**

	Commanders **Shura Members** **Village Elders**
Support for Taxation	- **Do you think that the people in the village should pay tax to village elders, central government or another organization?** *(MHH-4.15, MFG-5.10*) - **What percentage of their income should the people pay as tax?** (*MHH-4.16, MFG 5.11*) - **If people in the village are obliged to pay tax, whom should they pay the tax to?** (*MHH-4.17, MFG 5.12*)

Economic Institutions	
Agricultural Markets	- **Did you sell most of your products in the market?** (*MHH-6.89*) - **Where did the person you sold most of your product to come from?** (*MHH-6.90*) - **Who did you sell most of your products to? What was the status of the person?** (*MHH-6.91*) - **Could you select the buyer to your products yourself?** (*MHH-6.92*) - **Why couldn't you select the buyer to your products yourself?** (*MHH-6.93*) - **Where is the location of the market where you sold most of your products?** (*MHH-6.94*)
Borrowing	- **Where does the person live from whom you got the loan?** (*MHH-7.09*) - **What is the job of the person from who you got most of the loan?** (*MHH-7.10*) - **How much of your main loan did you pay back?** (*MHH-7.11*) - **Did you pay interest on your loan?** (*MHH-7.12, MFG-7.13*) - **What is the percentage of payable interest?** (*MHH-7.13, MFG-7.14*) - **How much should your household pay back for the main loan?** (*MHH-7.14*) - **If your household happens to get a loan who will be the first person they would go to for a loan?** (*MHH-7.15*) - **Why doesn't your household have anyone to get a loan from?** (*MHH-7.16*)

Trust and Community	
Trust	- **Imagine someone sends you money from another village. You and your family cannot get this money for instance you are ill and your family is not there, would you ask someone in your village who is not a member of your household to go and receive this money on your behalf?** (*MHH-5.05, MFG-6.07, FFG-4.12*) - **Has something like this ever happened?** (*MHH-5.06, MFG-6.08, FFG-4.13*)
Community	- **Do people of this village always help other people of the village, help and cooperated with them when necessary?** (*MHH-5.17, MFG-6.09, FFG-4.14*) - **Do you think help and cooperation among smaller groups of this village who live in smaller part of the village is more than that of the collective one in the entire village?** (*MHH-5.18, MFG-6.10, FFG-4.15*)

Disputes	
Incidence	- **Did anyone in your village have a legal case last year?** (*MHH-5.01, MFG-6.01*) - **Has this case been settled?** (*MHH-5.02, MFG-6.02*)

Resolution Structures	- **Has anyone within or outside the village helped in settling this case?** (*MHH-5.03, MFG-6.03*) - **Who has helped in settling this case?** (*MHH-5.04, MFG 6.04*)

Pre-Existing Conditions

Ethno-linguistic Fractionalization
- **What is your mother tongue?** (*MHH-1.12*) - **Which language most people in this village speak with?** (*MFG-2.15*)

NSP-Specific Data

CDC-Related Data	
CDC Members	**(Provided by FP and NSP)**
Members' Education	**(To be Collected in Project Completion Monitoring Exercise and Follow-Up Surveys)**
Vote Counts	**(Provided by FP)**

Project-Related Data	
Preferred Projects	- **We want you to think about what the council or village elders will do in the next year. What are the main work that you think the council or village elders should do?** (*MHH-3.17-.19, MFG-4.22-.25, FI-1.21*) - **What are the most important projects among the stated projects to be executed with this fund?** (*MHH-4.01-.03, MFG-5.01, FFG-3.01, FI-2.01-.03*)
Selected Projects	**(Provided by FP and NSP)**
Volume of Community Contribution	**(Provided by FP and NSP)**
Project Location	**(To be Collected in Project Completion Monitoring Exercise)**
Project Awareness	**(To be Collected in Project Completion Monitoring Exercise and Follow-Up Surveys)**

NSP-Related Data	
Attitude toward NSP	**(To be Collected in Follow-Up Surveys)**

Appendix III – Selection of 10 Sample Districts

Table 6 below lists the 74 'new' NSP districts and provides information related to the procedure used to select the 10 sample districts. In order to be selected to be a sample district, 'new' NSP districts essentially had to fulfill three criteria: (1) minimum of 65 villages across the three village lists; (2) stable security situation; and (3) contracted to an FP at the time at which the baseline survey was launched. Villages which met criteria (1) are highlighted in yellow, while those with instable security situations are in red. Information on the contracting status of the villages that met criteria (1) and (2) is provided in the far-right column. Although originally considered a 'new' NSP district, Kishim district in Badakhshan was later found to have been mobilized.

Table 6: List of 74 'New' NSP Districts

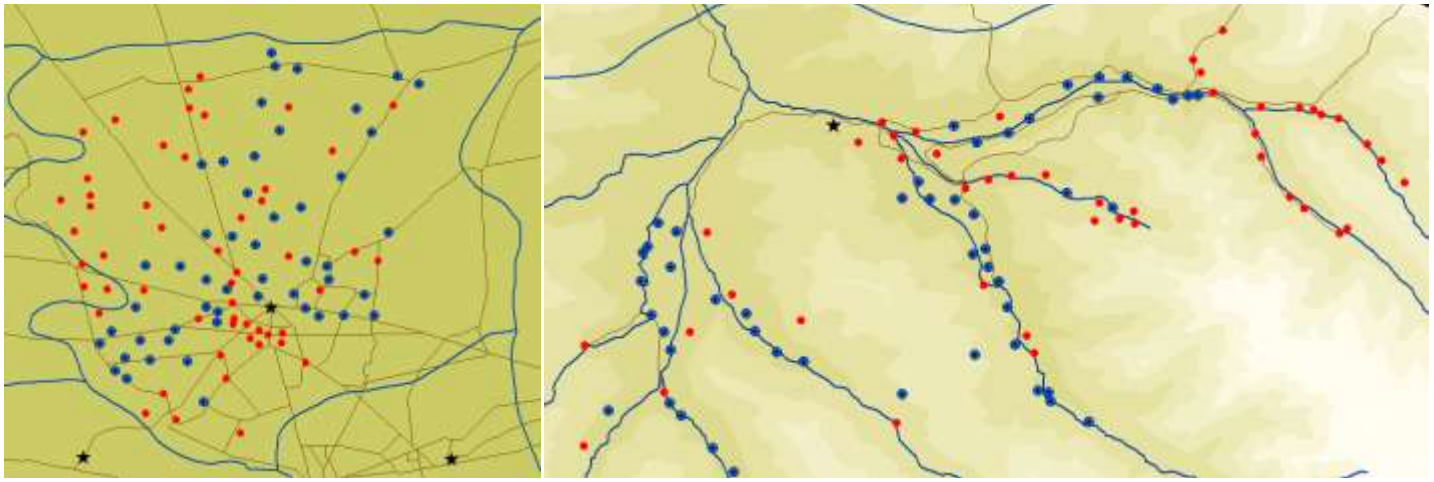
Province	District	Villages (CSO)	Villages (MRRD)	Villages (USAID)	Contracted?
Badakhshan	Arghanj Khwah	46	46	27	-
Badakhshan	Darayim	64	64	77	Yes
Badakhshan	Khwahan	42	42	44	-
Badakhshan	Kishim	100	98	93	-
Badakhshan	Tashkan	57	58	66	-
Badghis	Ghormach	100	96	47	-
Baghlan	Deh Salah	81	81	40	-
Baghlan	Firing Wa Gharu	28	28	10	-
Baghlan	Gozargah-I-Noor	25	25	11	-
Baghlan	**Khost Wa Firing**	133	133	75	Yes
Balkh	**Balkh**	121	118	103	Yes
Daykundi	Geti	134	134	152	No
Daykundi	Gizab	170		110	-
Daykundi	Kejran	42	42	71	-
Daykundi	**Sang Takht**	275	273	310	Yes
Faryab	Andkhoy	9	10	7	-
Faryab	Bilchiragh	44	44	14	-
Faryab	Gurziwan	54	53	35	-
Faryab	Kohistan	133	125	72	-
Faryab	Qurghan	13	13	-	-
Ghazni	Ab Band	70	69	43	-
Ghazni	Ajristan	56	55	60	-
Ghazni	Andar	257	256	183	-
Ghazni	Gelan	140	140	102	-
Ghazni	Giro	94	94	66	-
Ghazni	Khwaja Omari	36	35	41	-
Ghazni	Muqur	115	114	86	-
Ghazni	Nawa	32	32	105	-
Ghazni	Qara Bagh	430	426	207	-
Ghazni	Waghaz	120	119	91	-
Ghazni	Wali Mohammad Shahid Khugyani	64	63	42	-
Ghazni	Zanakhan	37	37	35	-
Ghor	**Duleena**	117	115	154	Yes

Herat	**Adraskan**	174	164	109	Yes
Herat	**Chishti Sharif**	68	68	71	Yes
Herat	**Fersi**	94	92	84	Yes
Herat	Ghoryan	75	79	43	-
Herat	**Gulran**	238	229	149	Yes
Herat	Kohsan	36	36	14	-
Herat	Shindand	353	337	258	-
Jawzjan	Khanaqa	45	44	16	-
Khost	Baak	32	32	8	-
Khost	Gurbuz	61	58	27	-
Khost	Nadirshah Kot	46	45	36	-
Khost	Qalandar	22	22	19	-
Khost	Sabari (Yaqubi)	63	63	-	-
Khost	Shamul	26	25	-	-
Kunarha	Bar Kunar	50	47	-	-
Kunarha	Chapa Dara	53	53	33	-
Kunarha	Dangam	42	39	26	-
Kunarha	Ghazi Abad	40	40	57	-
Kunarha	Nari	46	46	27	-
Kunarha	Shigal Wa Sheltan	79	79	21	-
Kunarha	Watapoor	75	74	13	-
Nangarhar	**Hesarak**	96	95	96	Yes
Nangarhar	Khugyani	149	149	91	-
Nangarhar	Kot	37	37	31	-
Nangarhar	Lalpoor	20	20	16	-
Nangarhar	Muhmand Dara	40	39	-	-
Nangarhar	Pachir Wagam	57	57	26	-
Nangarhar	**Sherzad**	112	111	66	Yes
Nangarhar	Shinwar	36	36	25	-
Paktika	Giyan	47	46	25	-
Paktika	Nika	23	23	9	-
Paktika	Sar Rawza	34	32	31	-
Paktika	Ziruk	21	21	20	-
Paktya	Jani Khel	73	73	68	-
Parwan	Shinwari	88	87	52	-
Takhar	Baharak	75	74	47	-
Takhar	Chahab	62	63	41	-
Takhar	Dashti Qala	49	47	18	-
Takhar	Hazar Sumuch	28	27	28	-
Takhar	Khwaja Bahawuddin	25	24	6	-
Takhar	Namak Ab	28	27	19	-

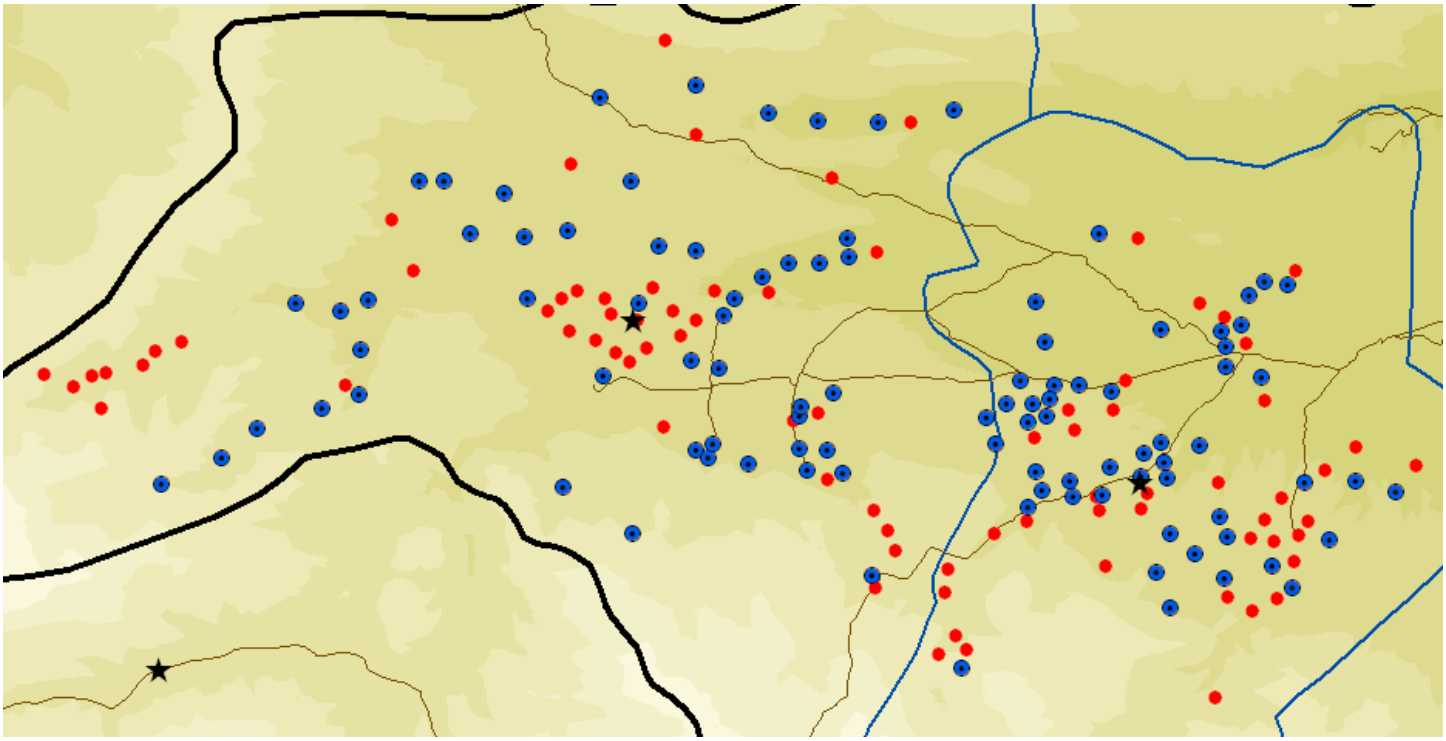
Appendix IV – Selection of Sample Villages

The figures below plot the villages eligible for selection (red circles) and villages 50 sample villages (blue circles) for the 10 sample districts. Location of district centers (black stars), roads (brown lines), rivers (blue lines), and district (blue lines) and provincial boundaries (black lines) are also plotted.

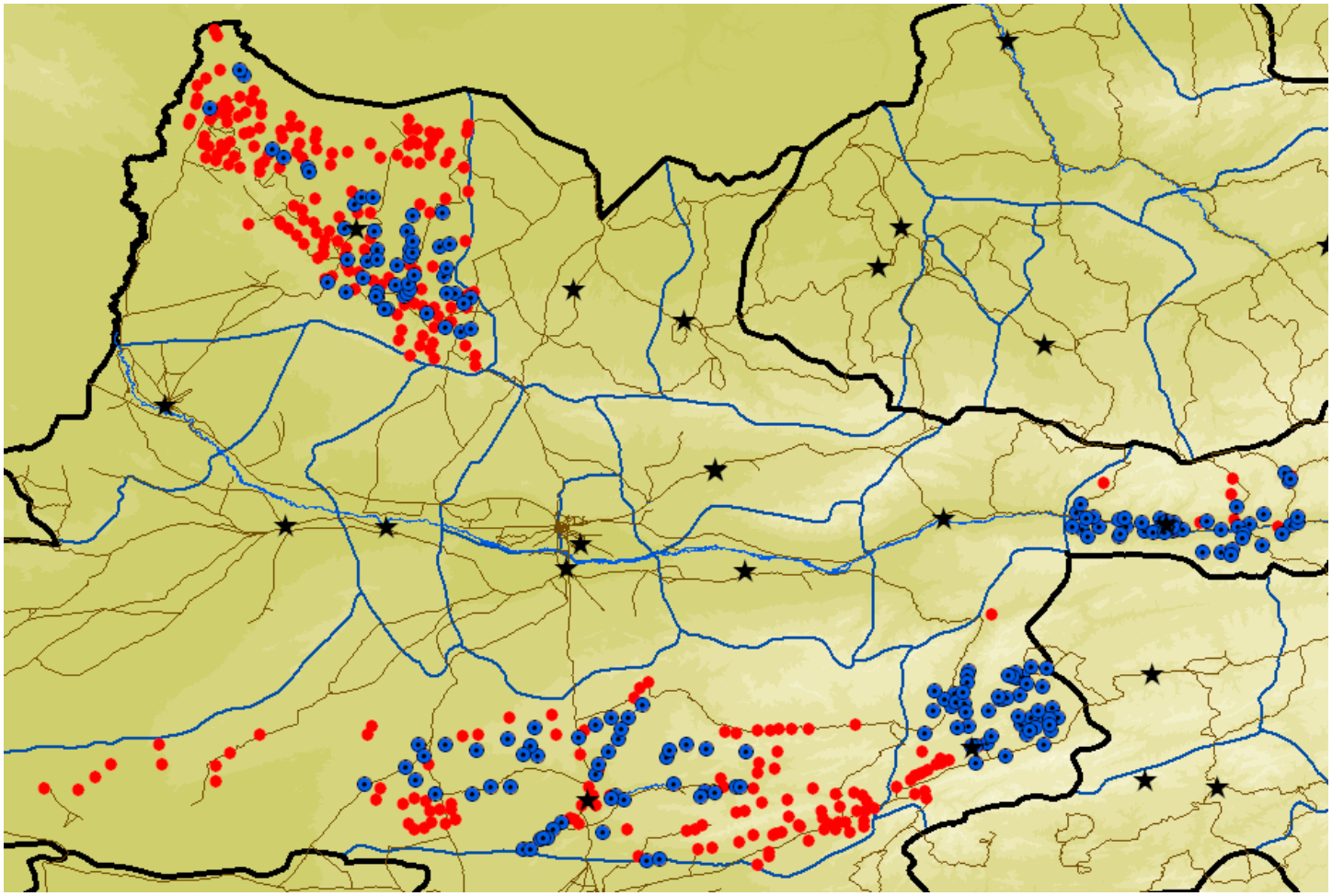
Balkh and Baghlan



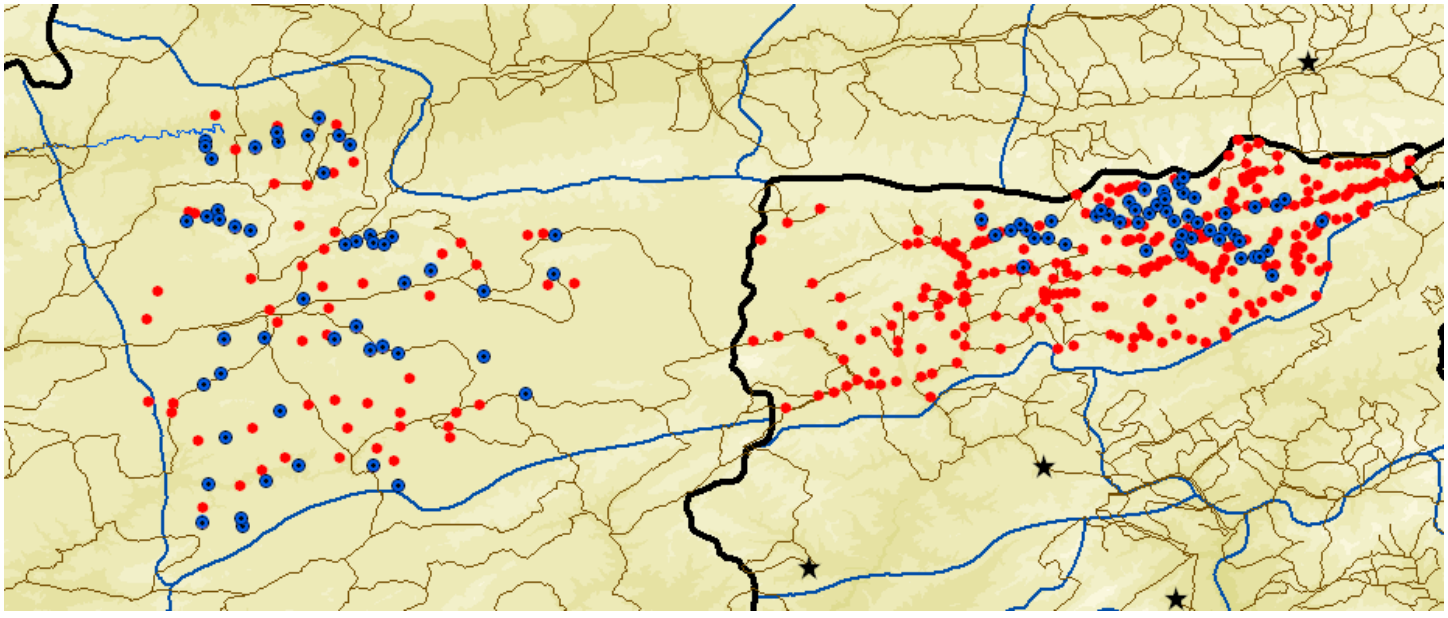
Nangahar



Herat



Ghor and Daykundi



Appendix V – Code for Formation of Matched Pairs (Gulran)

```
load Gulran.txt
y=Gulran;
Data=double(y);
Data(:,1)=[];
Data(:,1)=[];
s=size(Data);

 AAA=cov(Data);
    for k=1:s(2)
        if AAA(k,k)==0
          Data(:,k)=[];
        end;
    end

s=size(Data);

%Construct a matrix with combined distances

for j=1:s(1)
    for k=1:s(1)
        Distances(j,k)=sqrt((Data(j,:)-Data(k,:))*inv(cov(Data))*(Data(j,:)-Data(k,:))');
    end
end

%Distances
%Make sure that the distance with itself doesn't count
Maximum=max(max(Distances));
Maximum=Maximum+100;



for j=1:s(1)
    Distances(j,j)=Maximum;
end

%Make sure that clustered villages do not pair

for j=1:s(1)
   for i=1:s(1)
       if (y(i,2)==y(j,2)) & y(i,2)~=0;
        Distances(i,j)=Maximum;
       end;
   end
end


Matches=[y(:,1),(1000:999+s(1))'];
Distances_id=y(:,1);
Paired_data=zeros(s(1)/2, s(2));
Paired_Paired_data=zeros(floor(s(1)/4), s(2));

for l=1:floor(s(1)/2)
```

```
    [C,I]=min(Distances);
    [CC,II]=min(C);

    First_id=Distances_id(II);
    Matched_id=Distances_id(I(II));
    Paired_id(l,1)=First_id;
    Paired_id(l,2)=Matched_id;

    %record which observation is matched to which
    for m=1:s(1)
        if Matches(m,1)==First_id;
            Matches(m,2)=Matched_id;
            Matches(m,3)=l;
            Paired_data(l,:)= Paired_data(l,:)+Data(m,:);
            Pairs_groups(l,1)=y(m,2);

        end;
        if Matches(m,1)==Matched_id;
            Matches(m,2)=First_id;
            Matches(m,3)=l;
            Paired_data(l,:)= Paired_data(l,:)+Data(m,:);
            Pairs_groups(l,2)=y(m,2);
        end
    end

    %delete the pair that was matched
    Distances (:,I(II))=[];
    Distances (:,II)=[];
    Distances(I(II),:)=[];
    Distances(II,:)=[];
    Distances_id(I(II))=[];
    Distances_id(II)=[];

end
   Paired_data=Paired_data/2;


 AA=cov(Paired_data);
    for k=1:s(2)
        if AA(k,k)==0
          Paired_data(:,k)=[];
        end;
    end

   %Construct a matrix with combined distances for pairs

for j=1:s(1)/2
    for k=1:s(1)/2
        Distances_pairs(j,k)=sqrt((Paired_data(j,:)-Paired_data(k,:))*inv(cov(Paired_data))*(Paired_data(j,:)-
Paired_data(k,:))');
    end
end

%Make sure that the distance with itself doesn't count

Maximum=max(max(Distances_pairs));
```

```
Maximum=Maximum+100;

for j=1:s(1)/2
   Distances_pairs(j,j)=Maximum;
end

%Make sure that clustered villages do not pair

for j=1:s(1)/2
  for i=1:s(1)/2
      if ( Pairs_groups(i,1)==Pairs_groups(j,1) & Pairs_groups(i,1)~=0) | (
Pairs_groups(i,1)==Pairs_groups(j,2) & Pairs_groups(i,1)~=0) | ( Pairs_groups(i,2)==Pairs_groups(j,1) &
Pairs_groups(i,2)~=0) | ( Pairs_groups(i,2)==Pairs_groups(j,2) & Pairs_groups(i,2)~=0);
       Distances_pairs(i,j)=Maximum;
      end;
  end
end


for j=1:s(1)/2
 Distances_idP(j,1)=j;
end


for l=1:floor(s(1)/4)
   [CP,IP]=min(Distances_pairs);
   [CCP,IIP]=min(CP);
   First_idP=Distances_idP(IIP);
   Matched_idP=Distances_idP(IP(IIP));
   Paired_Paired_id(l,1)=Paired_id(First_idP,1);
   Paired_Paired_id(l,2)=Paired_id(First_idP,2);
   Paired_Paired_id(l,3)=Paired_id(Matched_idP,1);
   Paired_Paired_id(l,4)=Paired_id(Matched_idP,2);
   Paired_Paired_id(l,5)=First_idP;
   Paired_Paired_id(l,6)=Matched_idP;

   Paired_Paired_data(l,:)=(Paired_data(First_idP,:)+Paired_data(Matched_idP,:))/2;
   Paired_Paired_groups (l,1:2)=Pairs_groups(First_idP,1:2);
   Paired_Paired_groups (l,3:4)=Pairs_groups(Matched_idP,1:2);

   %delete the pair that was matched
   Distances_pairs (:,IP(IIP))=[];
   Distances_pairs (:,IIP)=[];
   Distances_pairs (IP(IIP),:)=[];
   Distances_pairs (IIP,:)=[];
   Distances_idP(IP(IIP))=[];
   Distances_idP(IIP)=[];

end

  Unpaired(1,1)=Paired_id(Distances_idP,1);
  Unpaired(1,2)=Paired_id(Distances_idP,2);


A=cov(Paired_Paired_data);
   for k=1:s(2)
```

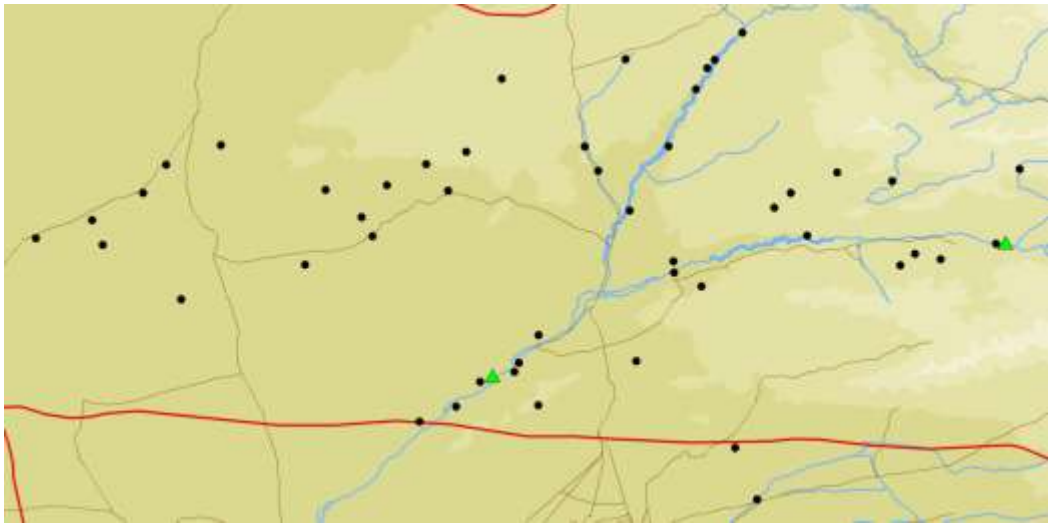
```
      if A(k,k)==0
        Paired_Paired_data(:,k)=[];
      end;
   end

%Construct a matrix with combined distances for pairs of pairs

for j=1:floor(s(1)/4)
   for k=1:floor(s(1)/4)
      Distances_pairs_pairs(j,k)=sqrt((Paired_Paired_data(j,:)-
Paired_Paired_data(k,:))*inv(cov(Paired_Paired_data))*(Paired_Paired_data(j,:)-
Paired_Paired_data(k,:))');
   end
end


%Make sure that the distance with itself doesn't count

Maximum=max(max(Distances_pairs_pairs));
Maximum=Maximum+100;

%Make sure that clustered villages do not pair

for j=1:floor(s(1)/4)
  for i=1:floor(s(1)/4)
     if ((  Paired_Paired_groups(i,1)== Paired_Paired_groups(j,1) |  Paired_Paired_groups(i,1)==
Paired_Paired_groups(j,2) | Paired_Paired_groups(i,1)== Paired_Paired_groups(j,3) |
Paired_Paired_groups(i,1)== Paired_Paired_groups(j,4) )&  Paired_Paired_groups(i,1)~=0) | ((
Paired_Paired_groups(i,2)== Paired_Paired_groups(j,1) |  Paired_Paired_groups(i,2)==
Paired_Paired_groups(j,2) | Paired_Paired_groups(i,2)== Paired_Paired_groups(j,3) |
Paired_Paired_groups(i,2)== Paired_Paired_groups(j,4) )&  Paired_Paired_groups(i,2)~=0) |((
Paired_Paired_groups(i,3)== Paired_Paired_groups(j,1) |  Paired_Paired_groups(i,3)==
Paired_Paired_groups(j,2) | Paired_Paired_groups(i,3)== Paired_Paired_groups(j,3) |
Paired_Paired_groups(i,3)== Paired_Paired_groups(j,4) )&  Paired_Paired_groups(i,3)~=0) |((
Paired_Paired_groups(i,4)== Paired_Paired_groups(j,1) |  Paired_Paired_groups(i,4)==
Paired_Paired_groups(j,2) | Paired_Paired_groups(i,4)== Paired_Paired_groups(j,3) |
Paired_Paired_groups(i,4)== Paired_Paired_groups(j,4) )&  Paired_Paired_groups(i,4)~=0) ;
       Distances_pairs_pairs(i,j)=Maximum;
      end;
  end
end


for j=1:floor(s(1)/4)
   Distances_pairs_pairs(j,j)=Maximum+1;
end


for j=1:floor(s(1)/4)
 Distances_idPP(j,1)=j;
end


for l=1:floor(s(1)/4)/2
   [CPP,IPP]=min(Distances_pairs_pairs);
   [CCPP,IIPP]=min(CPP);
```

```
    First_idPP=Distances_idPP(IIPP);
    Matched_idPP=Distances_idPP(IPP(IIPP));
    Paired_Paired_Paired_id(l,1:4)=Paired_Paired_id(First_idPP,1:4);
    Paired_Paired_Paired_id(l,5:8)=Paired_Paired_id(Matched_idPP,1:4);
Paired_Paired_id(First_idPP,1:4);
    Paired_Paired_id(Matched_idPP,1:4);

    Paired_Paired_Paired_Paired_id(l,9)=First_idPP;
    Paired_Paired_Paired_Paired_id(l,10)=Matched_idPP;

    %Paired_Paired_data(l,:)=(Paired_data(First_idP,:)+Paired_data(Matched_idP,:))/2;


    %delete the pair that was matched

    Distances_pairs_pairs (:,IPP(IIPP))=[];
    Distances_pairs_pairs (:,IIPP)=[];
    Distances_pairs_pairs (IPP(IIPP),:)=[];
    Distances_pairs_pairs (IIPP,:)=[];
    Distances_idPP(IPP(IIPP))=[];
    Distances_idPP(IIPP)=[];
end

Matched_status_ID=zeros(s(1),4);
Matched_status_ID=y(:,1);
for l=1:s(1)
    for i=1:6

        for j=1:8
            if Paired_Paired_Paired_id(i,j)==Matched_status_ID(l,1)
              Matched_status_ID(l,2)=(i-1)*4+ceil(j/2);
              Matched_status_ID(l,3)=(i-1)*2+ceil(j/4);
              Matched_status_ID(l,4)=i;
            end;
        end
    end
end
 Matched_status_ID(:,5)=y(:,2);
        save ('Gulran_Matching.txt','Matched_status_ID','-ascii')
```

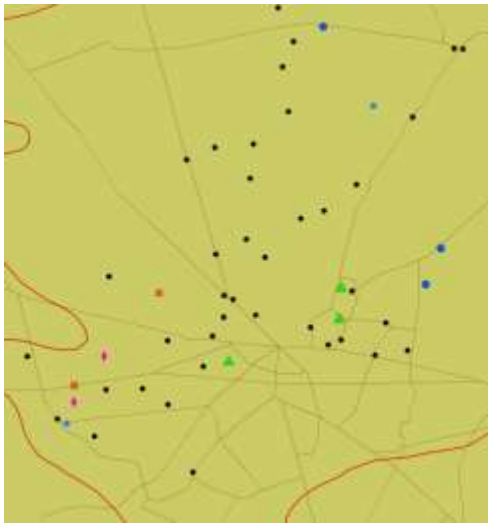
Appendix VI – Maps of Clusters

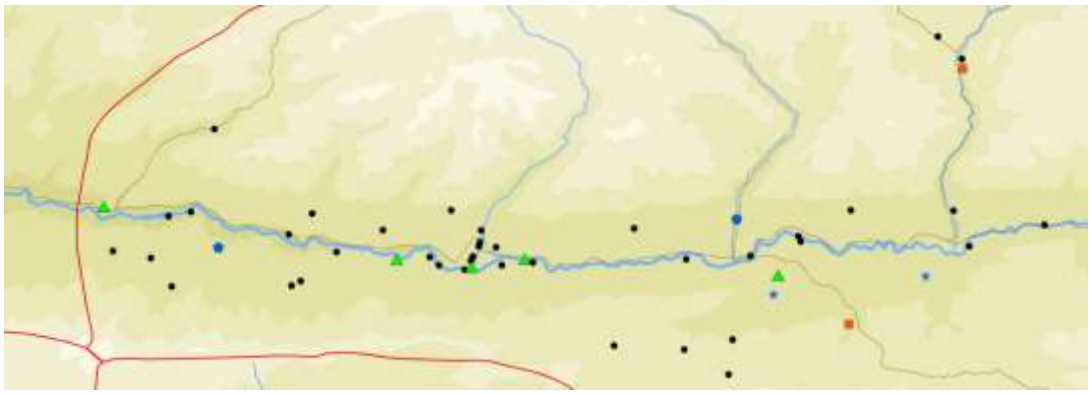
Villages assigned to a single cluster are denoted with a common symbol. Villages not belonging to clusters are denoted with a black circle. Uses GPS coordinates collected during baseline survey.

Adraskan



Balkh

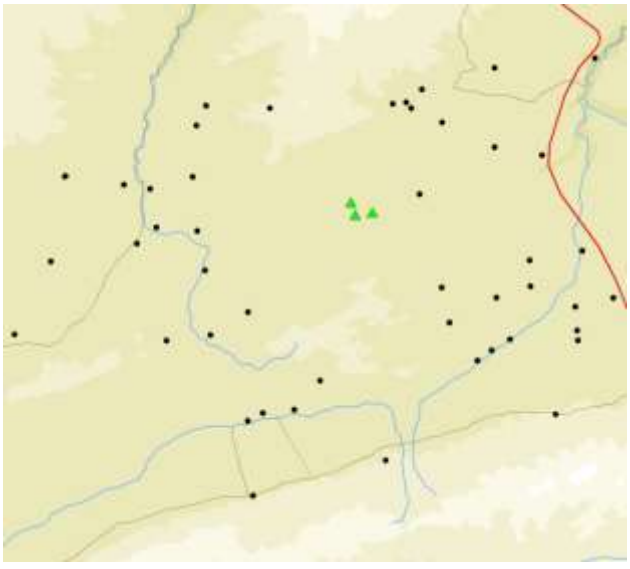




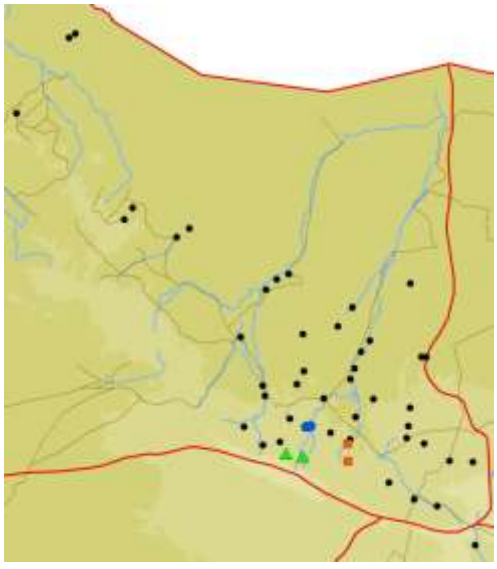
Chist-e Sharif

Daulina

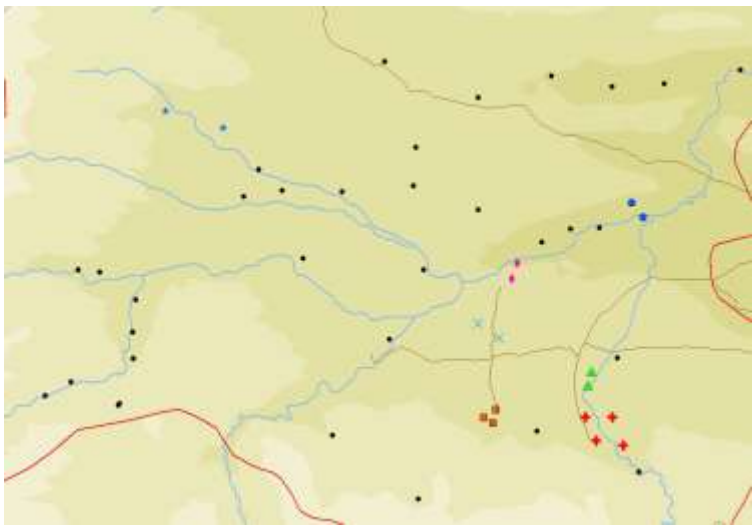
Farsi



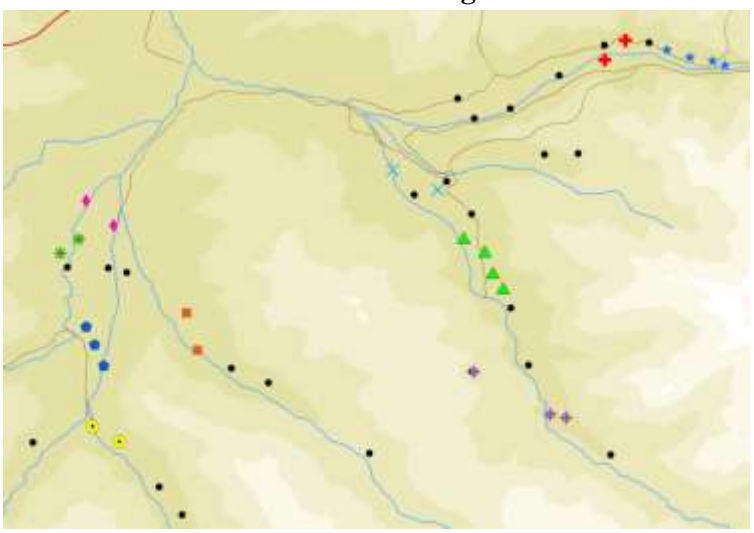
Gulran

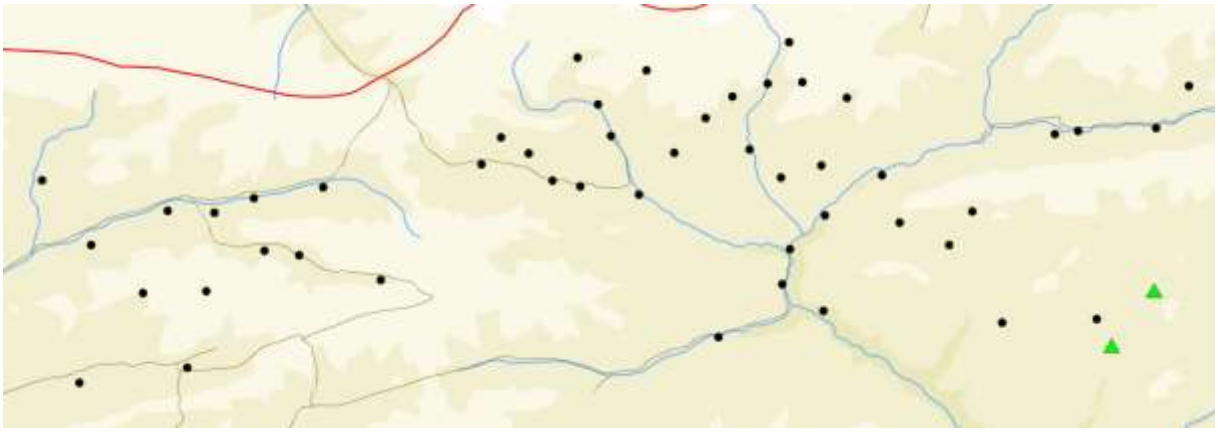


Hisarak



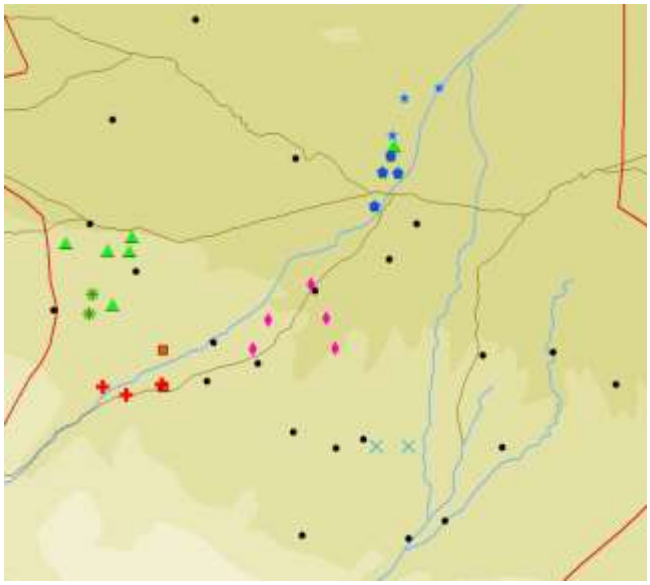
Khost Wa Firing





Sang Takht

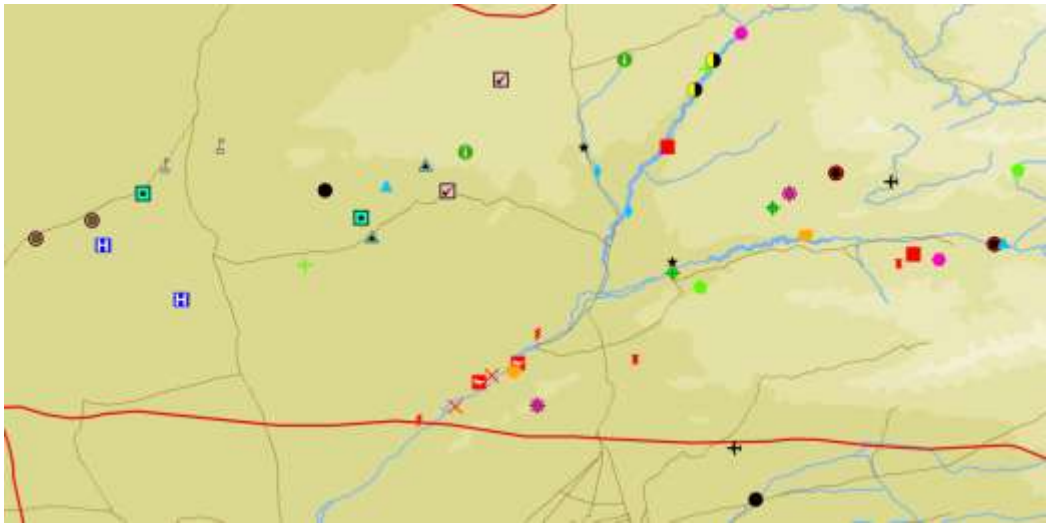
Sherzad



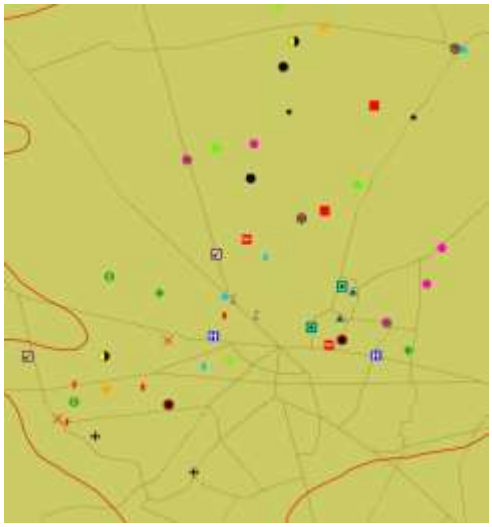
Appendix VII – Maps of Matched Pairs

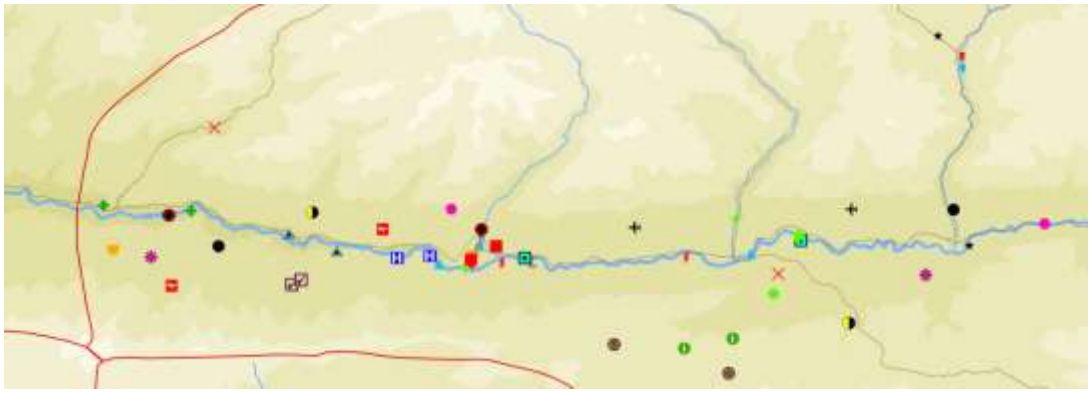
Villages assigned to a single matched pair are denoted with a common symbol.

Adraskan



Balkh

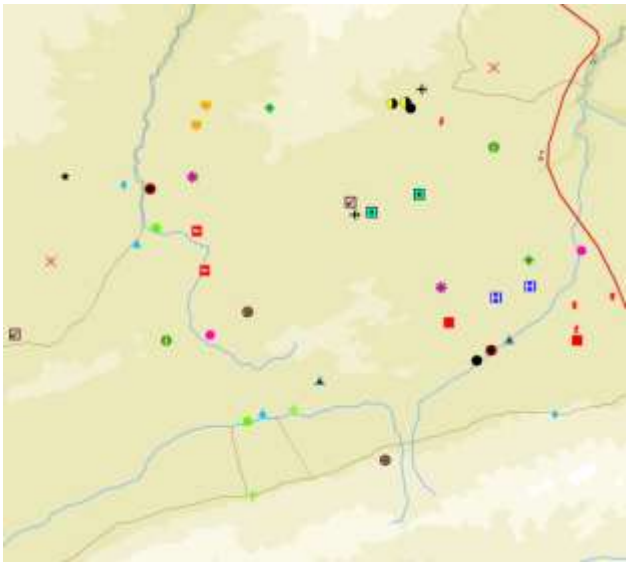




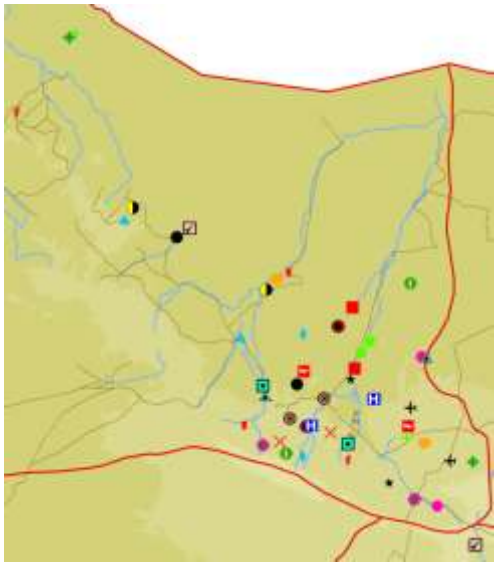
Chist-e Sharif

Daulina

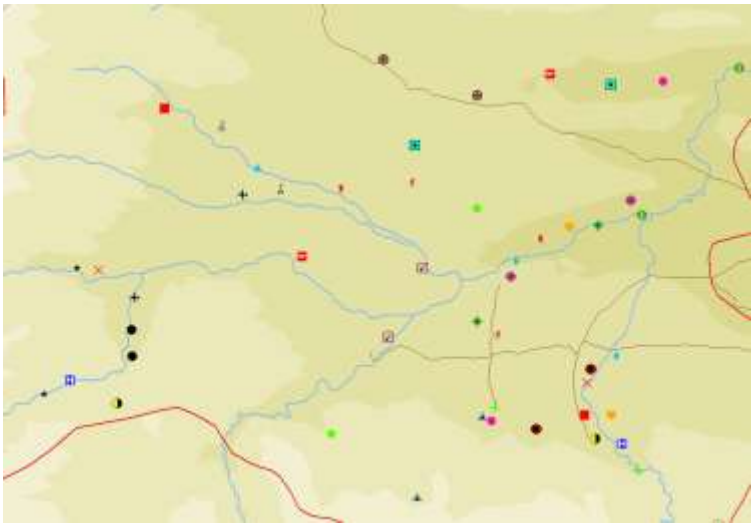
Farsi



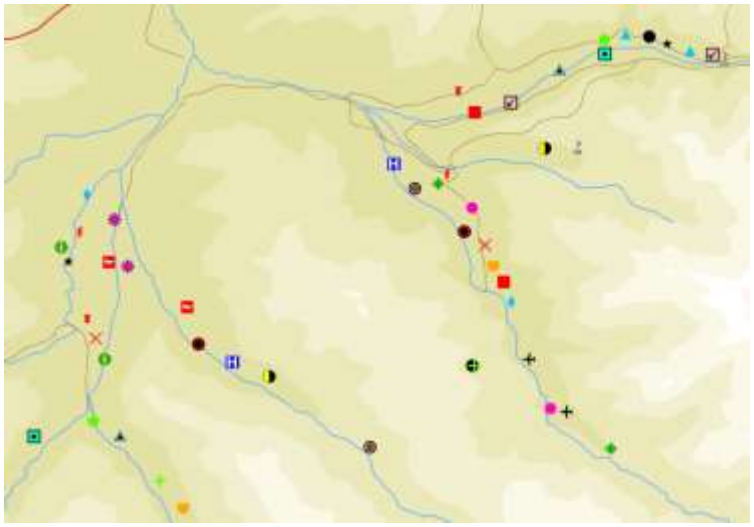
Gulran

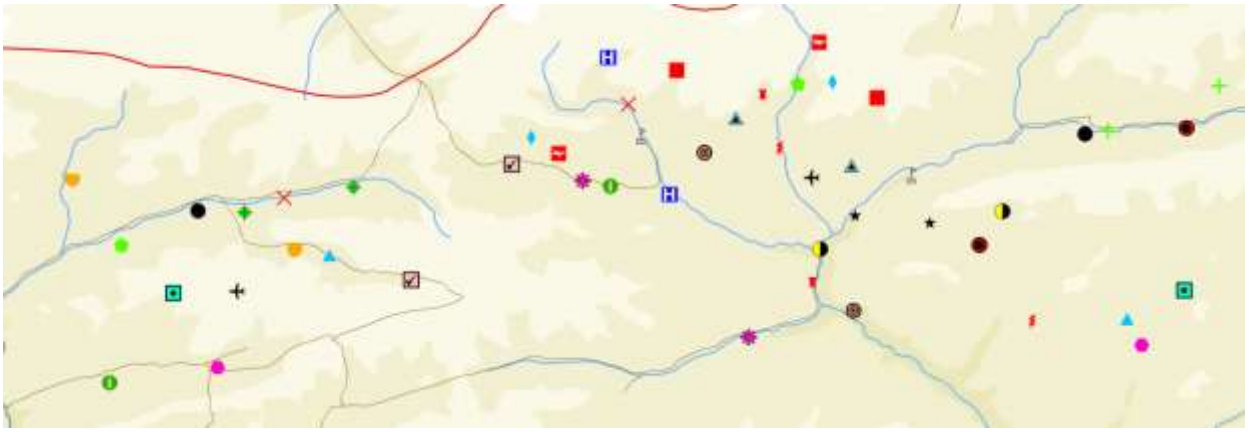


Hisarak



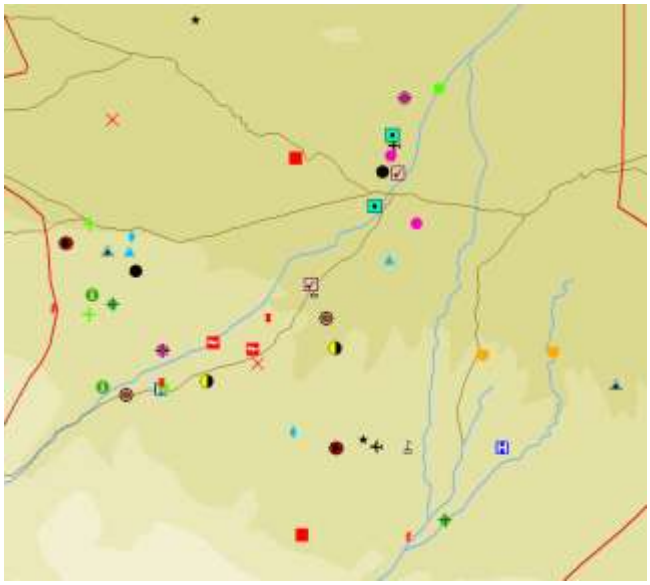
Khost Wa Firing





Sang Takht

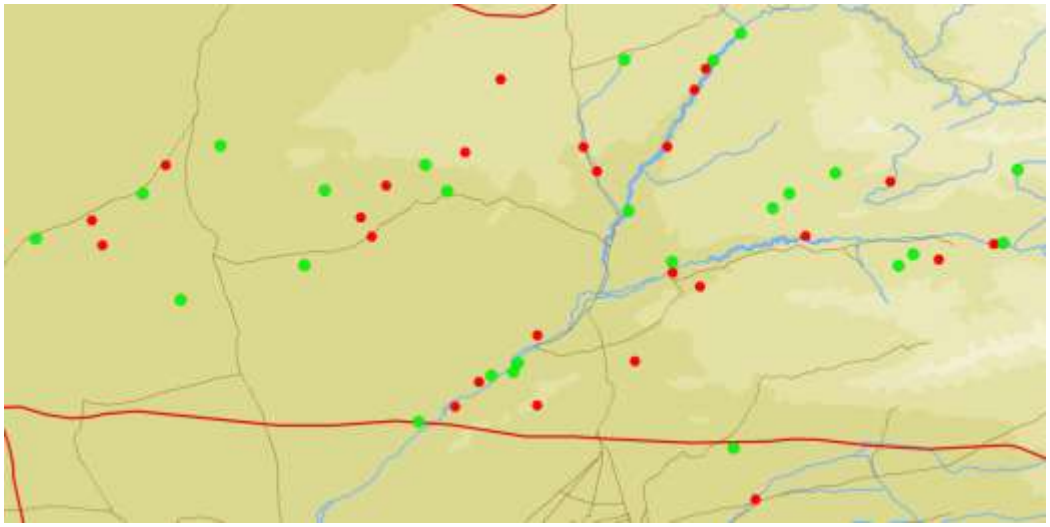
Sherzad



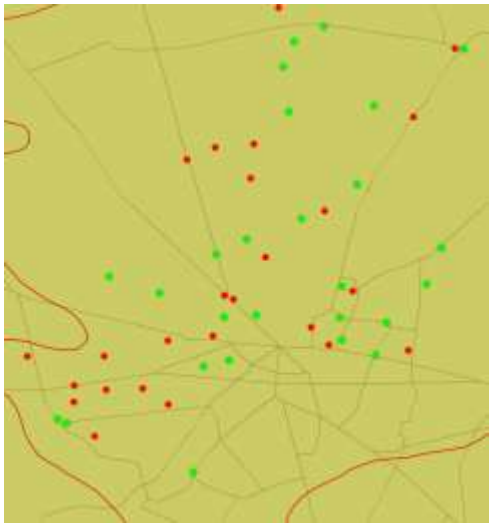
Appendix VIII – Maps of Treatment Assignments

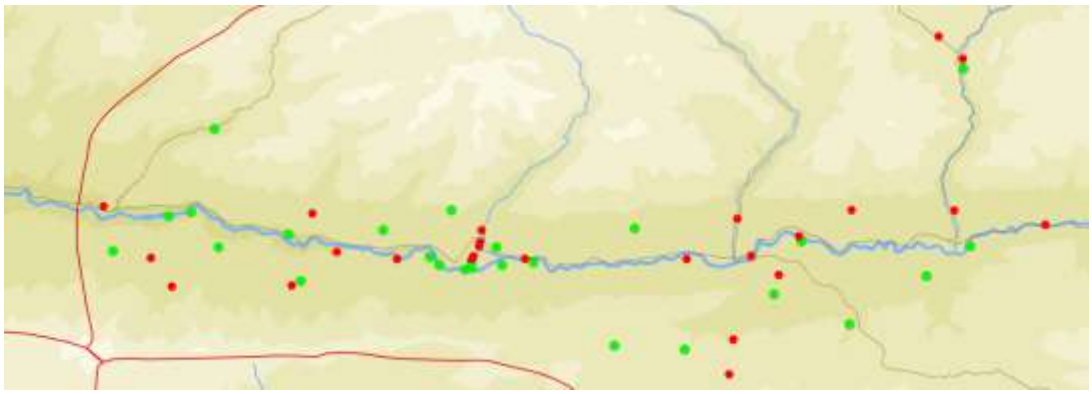
Villages assigned to participate in NSP (treatment group) are denoted with a green circle. Villages assigned to not participate in NSP (control group) are denoted with a red hexagon.

Adraskan



Balkh

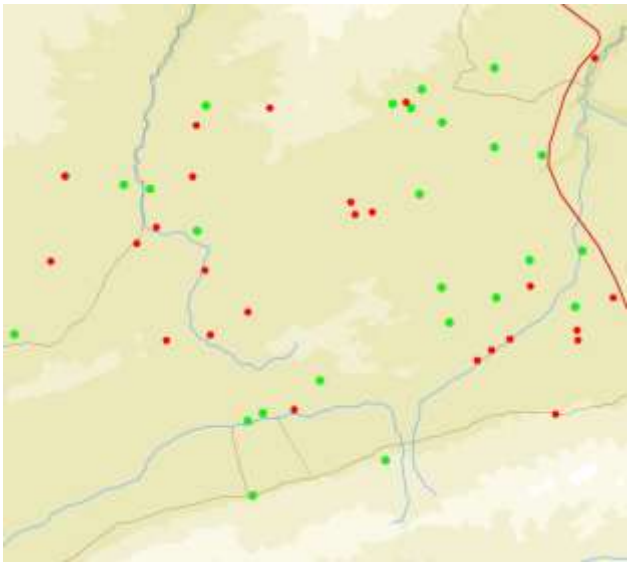




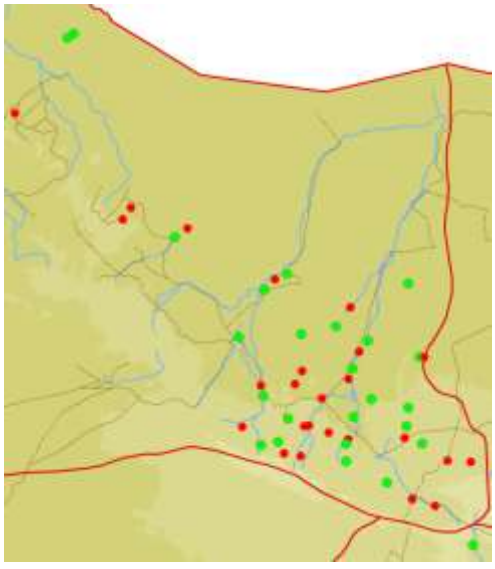
Chist-e Sharif

Daulina

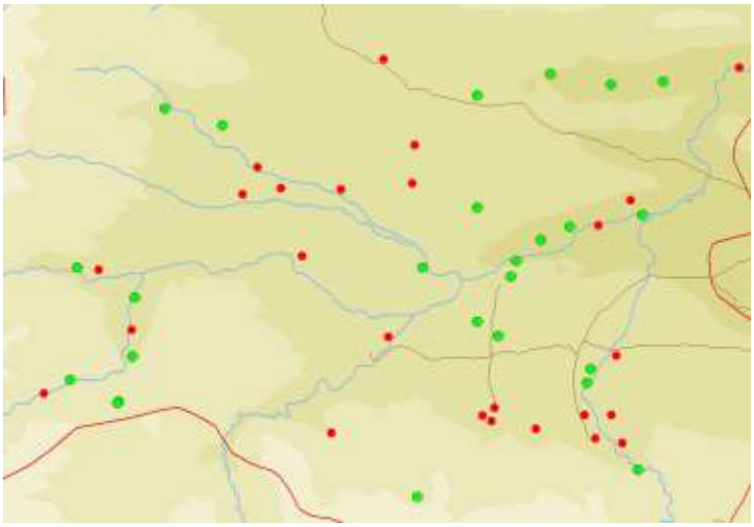
Farsi



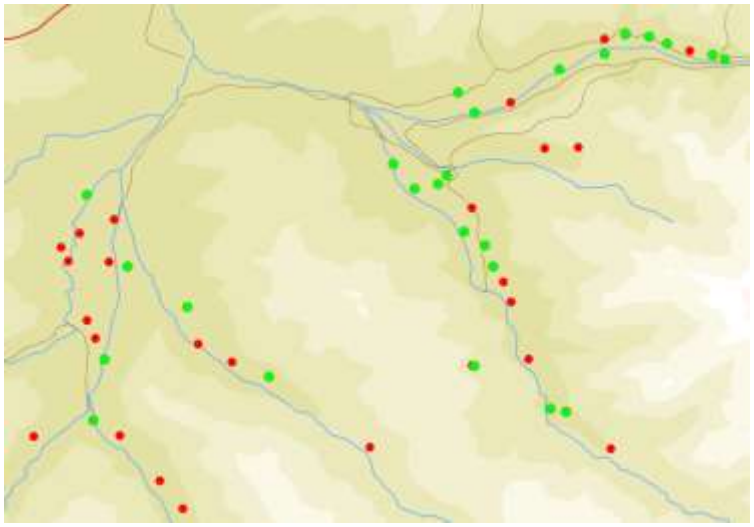
Gulran

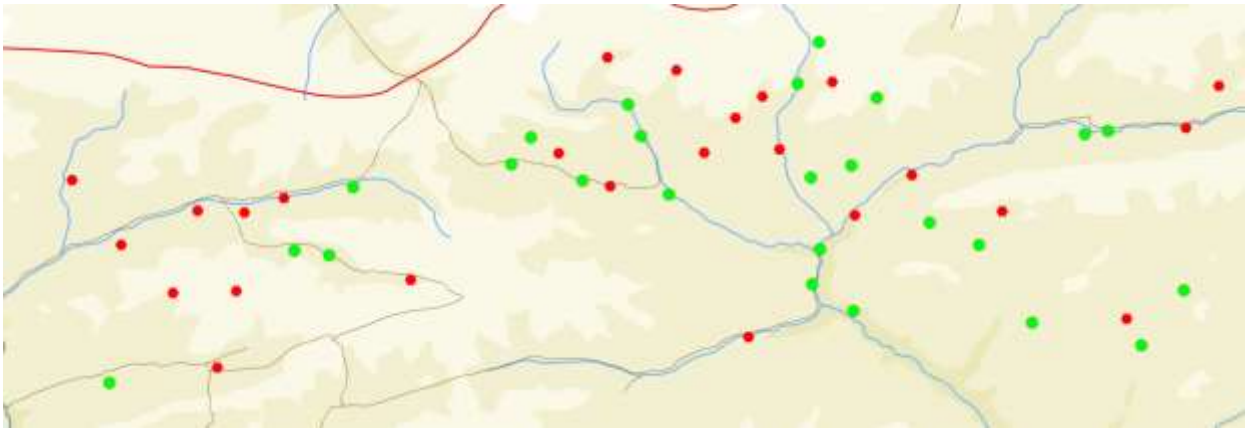


Hisarak



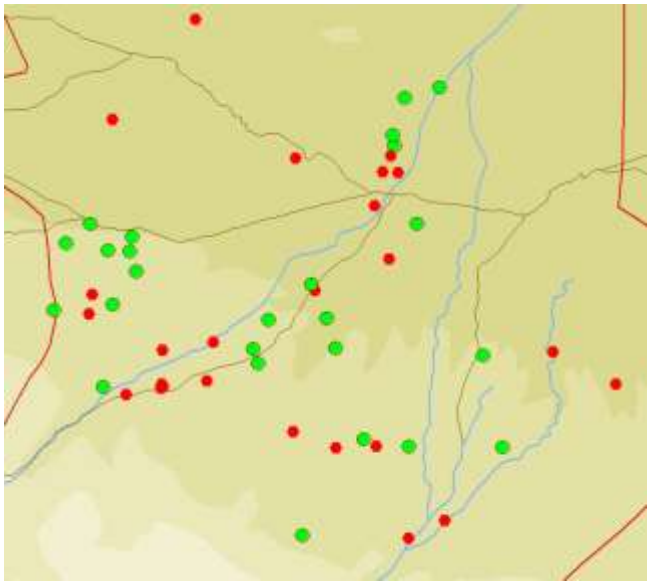
Khost Wa Firing





Sang Takht

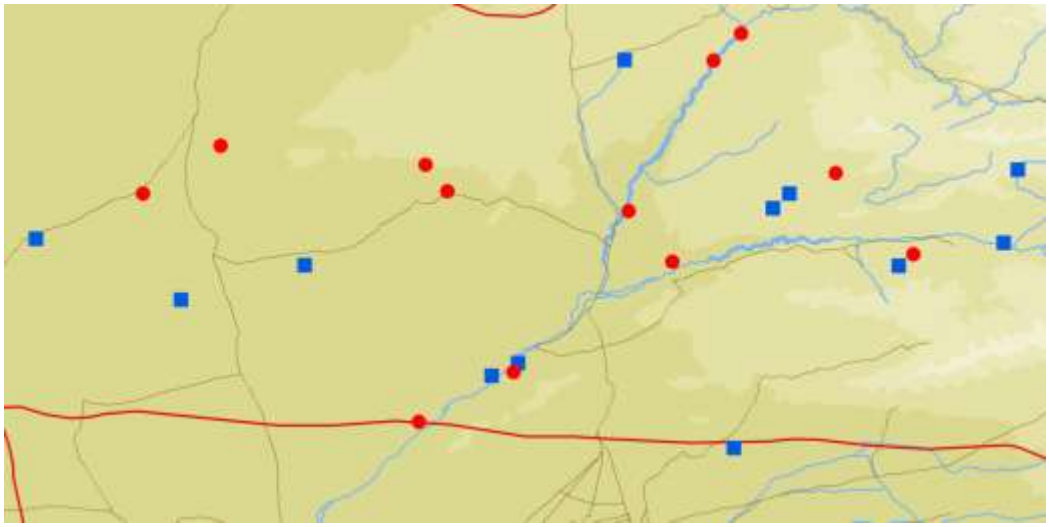
Sherzad



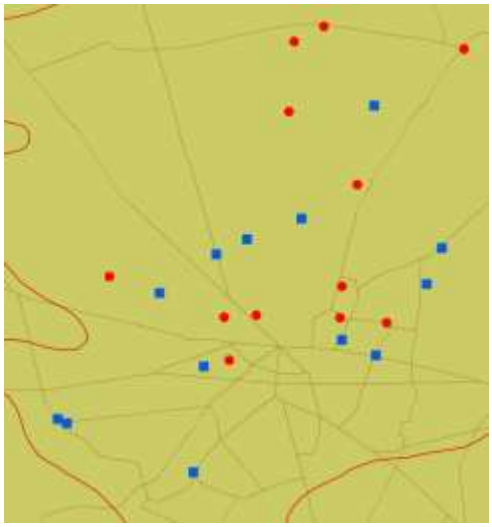
Appendix IX – Maps of Election Method Assignments

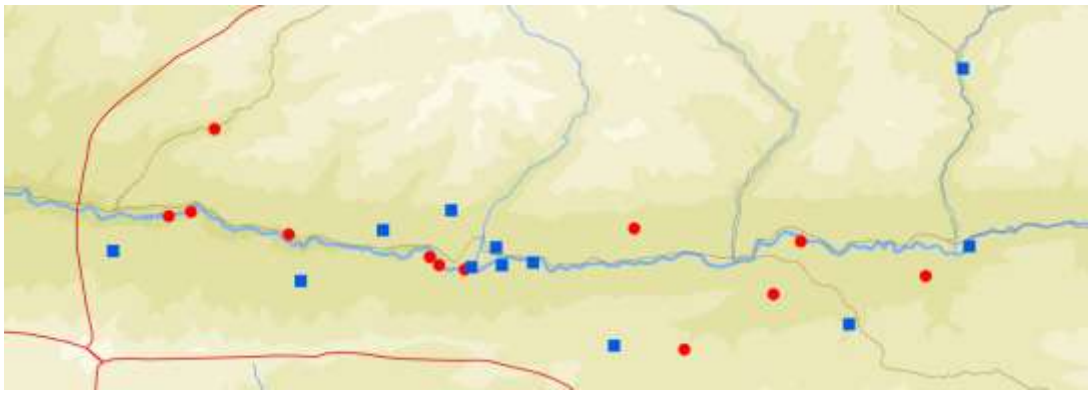
Villages assigned to hold ward elections are denoted with red circles. Villages assigned to at-large elections are denoted with blue squares.

Adraskan



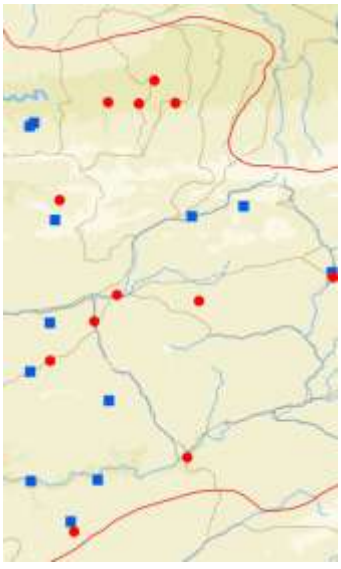
Balkh



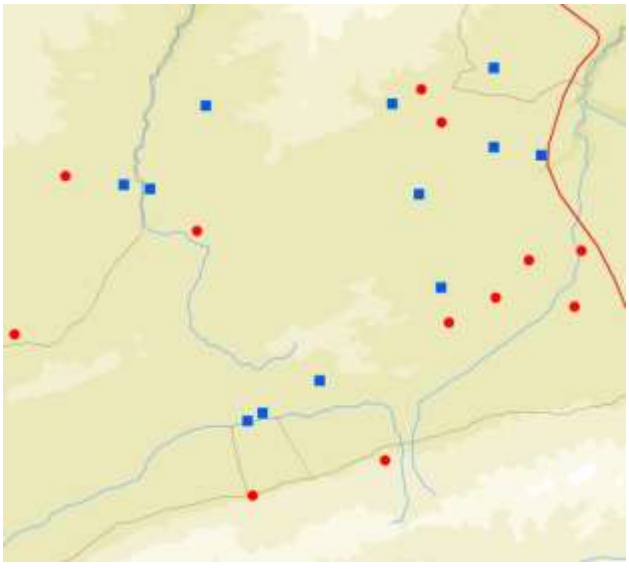


Chist-e Sharif

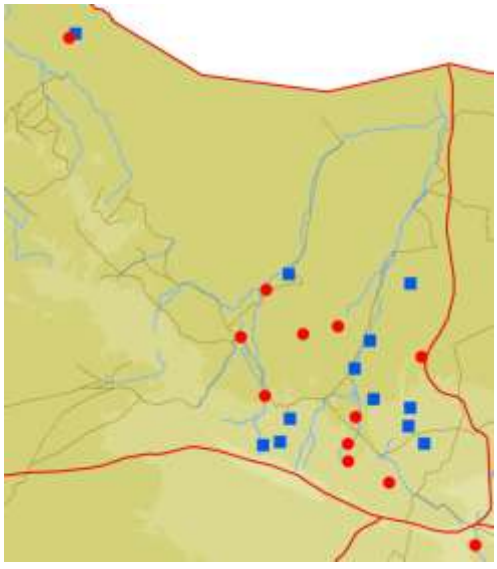
Daulina



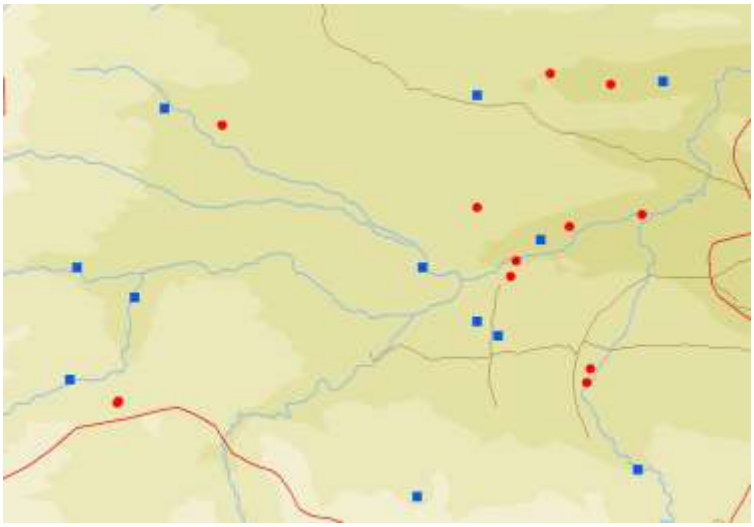
Farsi



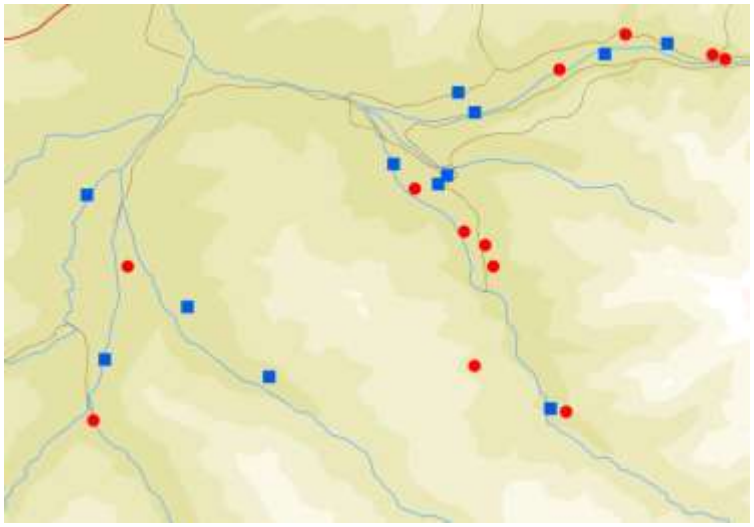
Gulran

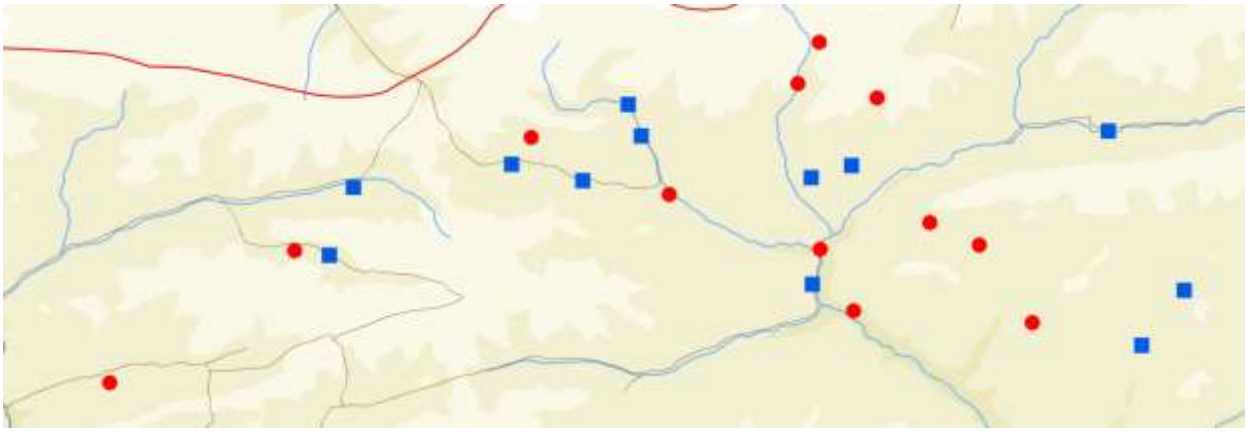


Hisarak



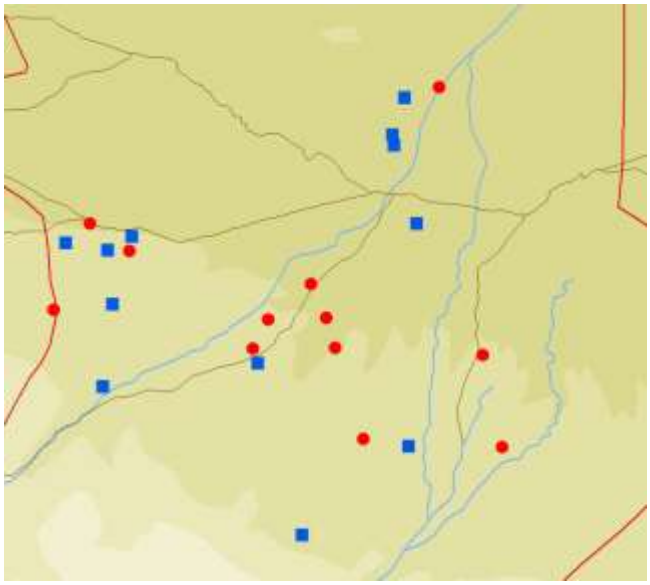
Khost Wa Firing





Sang Takht

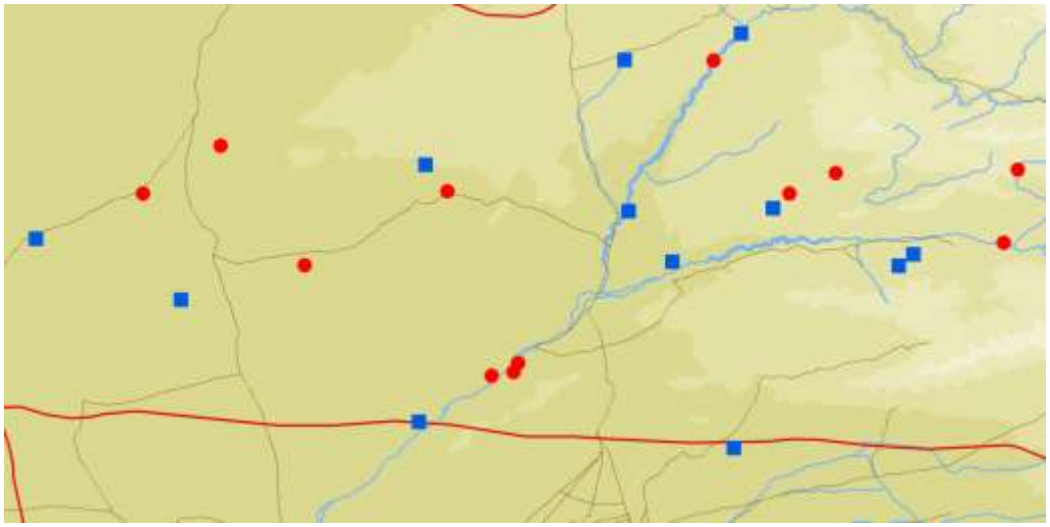
Sherzad



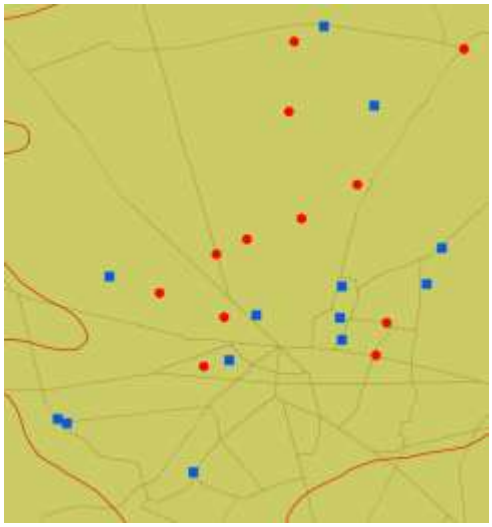
Appendix X – Maps of Project Selection Procedure Assignments

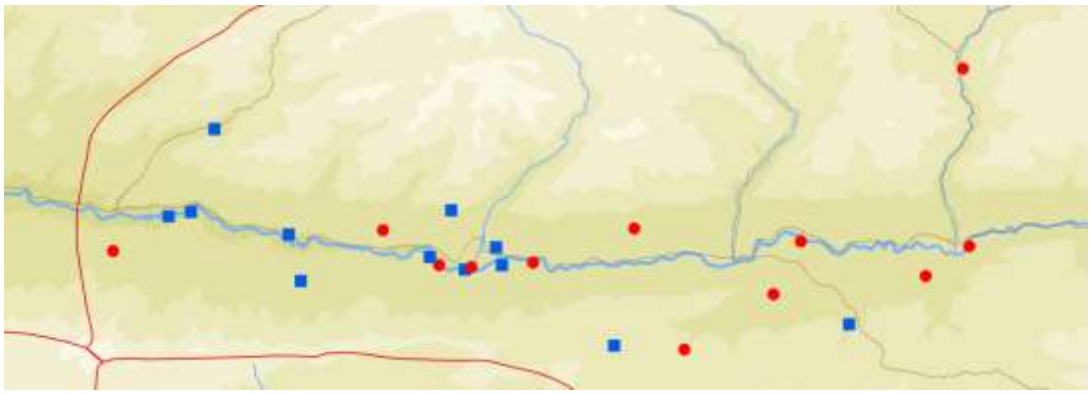
Villages assigned to select projects through consultation meetings are denoted with red circles. Villages assigned to select projects through referenda are denoted with red circles.

Adraskan



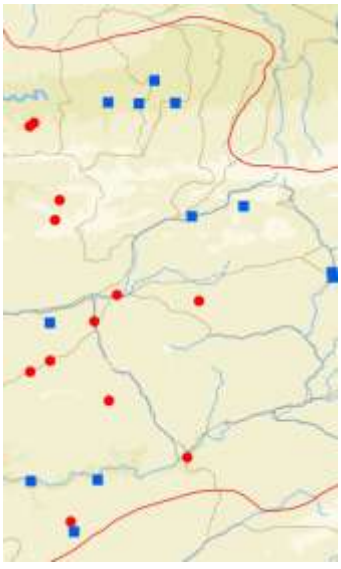
Balkh



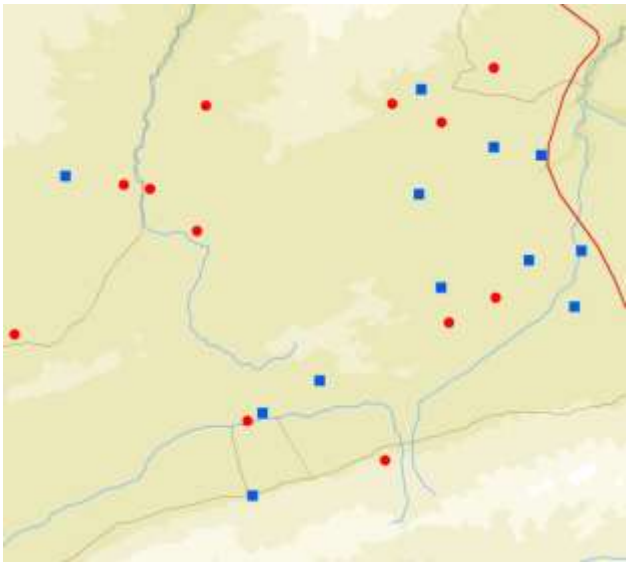


Chist-e Sharif

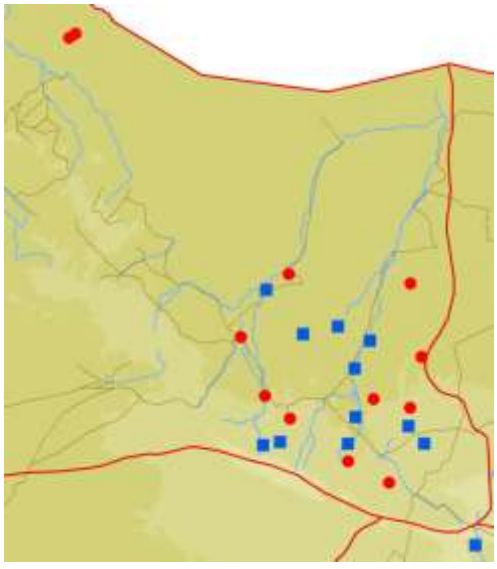
Daulina



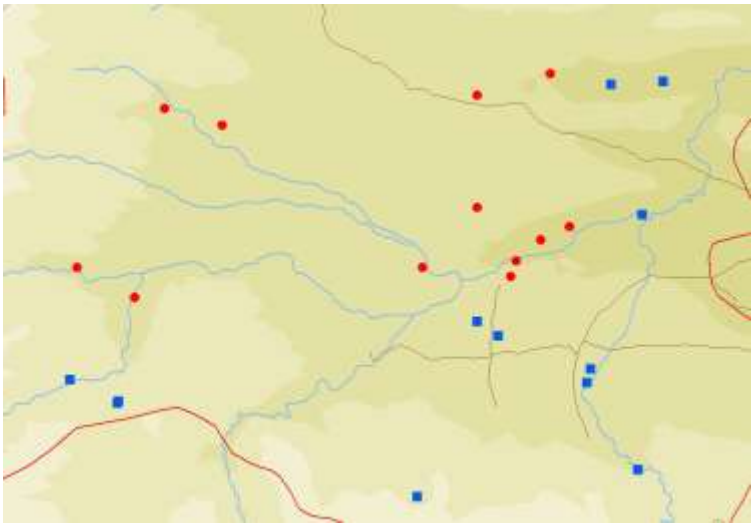
Farsi



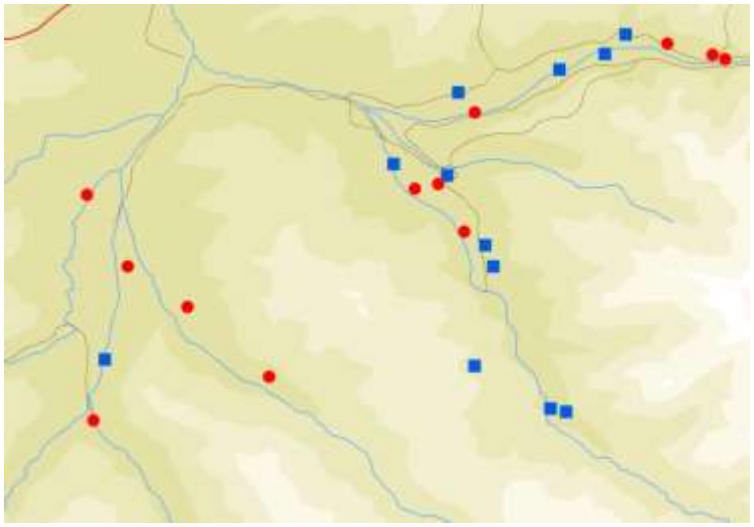
Gulran

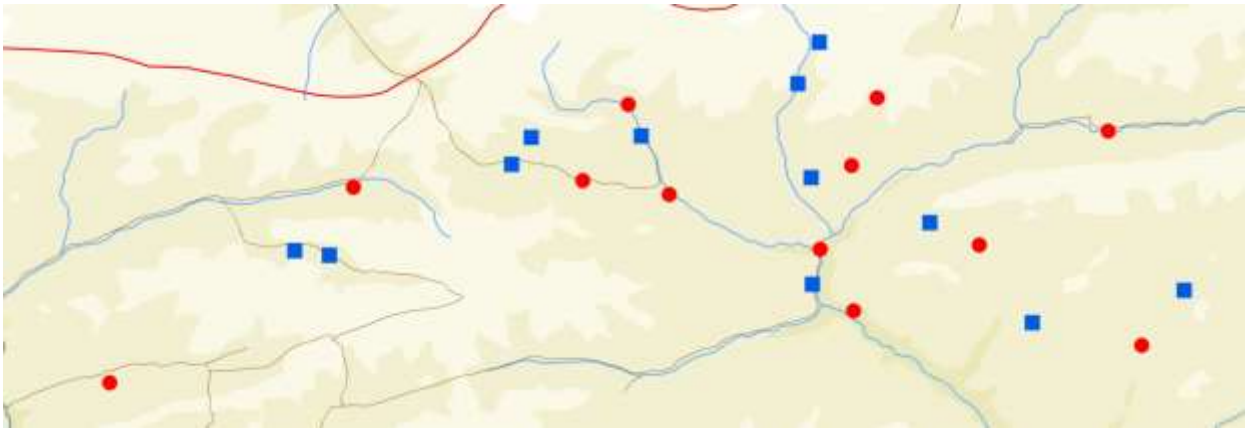


Hisarak



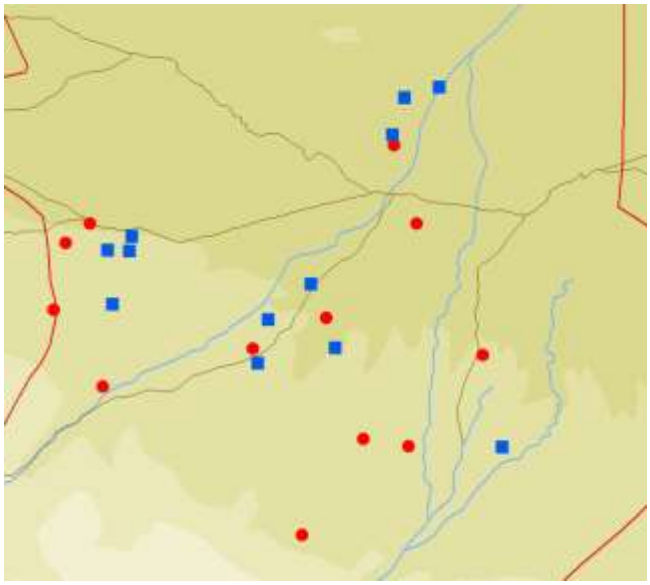
Khost Wa Firing





Sang Takht

Sherzad



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