

Determinants of Collective Action under Devolution Initiatives: The Case of Citizen Community Boards in Pakistan

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In 2001, a scheme called Citizen Community Board (CCB), a kind of community-based organisation (CBO), was introduced in Pakistan, under which local people propose development projects to the local government through forming a CCB, and upon approval the local government funds 80 percent of the project cost. Since 2001, however, both the number of CCBs and that of approved projects have been below the expected level. This raises a concern that the Pakistani society with limited historical experience in CBO-based development is too handicapped for the CCB scheme to be successful. This paper addresses this concern through quantifying the determinants of successful formation of a CCB and those of successful development activities conditional on the formation. The regression results using a cross-section dataset in a district in Pakistan Punjab in 2004-05 suggest that the rules within a CCB and the type of leadership are key to the success of CCB initiatives.

1. INTRODUCTION

In the theory of development economics, the role of community in economic development has been one of the focal issues [Hayami and Godo (2005)]. On the policy side as well, devolution initiatives with community as a key actor are currently undertaken in a number of developing countries to decentralise development planning and execution. The rationale behind the initiatives is the idea that decentralisation through community participation can contribute to efficiency, accountability, and transparency of poverty reduction policies through the utilisation of local information

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and resources and through nurturing the sense of ownership [Bardhan (2002)]. However, as Bardhan and Mukherjee (2000, 2005) show theoretically, such initiatives may be vulnerable to the capture by local elites. Whether the decentralisation and local participation improve the welfare of disadvantaged people thus becomes an empirical question. Bardhan and Mukherjee (2003) demonstrate that within-village targeting is more pro-poor than between-village targeting in West Bengal where supporters of the leftist government supervise resource allocation at the local level. Galasso and Ravallion (2005) show that within-village targeting to the poor improved in Bangladesh's Food-for-Education programme, though they find some evidence of local capture. Yamauchi (2005) also finds that targeting performance improved after devolution in Indonesia when communities had high administrative capability. According to the survey by Mansuri and Rao (2004), the evidence on whether devolution improved targeting and public goods formation is mixed but tends to be positive under enabling institutional environment. At the same time, Mansuri and Rao (2004) point out the difficulty in establishing causality.

Another strand of related literature is empirical studies on the determinants of collective action to manage common property resources [see Bandiera, *et al.* (2005) for a recent survey]. Among common property resources, the determinants of collective management of an irrigation system have been investigated by a number of authors [Wade (1988); Bardhan (2000); Dayton-Johnson (2000); Meinzen-Dick, *et al.* (2002)]. As far as the irrigation management is concerned, the impact of collective management on the efficiency of irrigation has also been investigated empirically [Sakurai and Palanisami (2001); Gragasin, *et al.* (2005); Kajisa (2005)]. These studies have shown that as determinants of collective action (especially in irrigation), focal variables include social heterogeneity, group size, asset inequality, and leadership. Most studies find that inequality and social heterogeneity are detrimental to successful collective action. The effects of group size or leadership depend on the empirical context.

Combining the two strands of literature, we are left with unresolved questions such as (1) How do decentralisation and local participation improve the welfare of disadvantaged people under good local governance? Does the allocation by the leader matter (driven by changes in rules or by demand from below) or is the actual participation of the poor in the process of resource allocation important?¹ (2) Are the determinants of collective action found for irrigation management valid as the determinants of the participation by the poor when the governance rules are changed under devolution?

This paper attempts to address these questions by investigating the determinants of collective action involved in development initiatives based on community-based organisations (CBO) under devolution. The case of concern is the Pakistani society

¹Among the existing studies, Yamauchi (2005) investigates whether community participation improves pro-poor targeting in Indonesia, but her result shows that this route is not statistically significant.

with limited historical experience in CBO-based cooperation in development. At the core of the Pakistan's devolution initiatives lies a scheme called Citizen Community Board (CCB), a kind of CBO. Under the scheme, local people propose to the local government development projects through forming a CCB and upon approval the local government funds 80 percent of the project cost. Since 2001 when the scheme was initiated, however, both the number of CCBs and that of approved projects have been below the expected level. This paper thus investigates the determinants of formation of a CCB and those of successful development activities conditional on the formation. The whole process for villagers to form a CCB and then to prepare a project proposal is regarded as the collective action examined in this paper.

The paper is organised as follows. Section 2 describes the background, introducing CCBs in Pakistan. Section 3 proposes the empirical model after a brief description of the dataset used in the empirical analysis. Section 4 provides the estimation results, first for the determinants of formation of a CCB, and, second for the determinants of successful development activities conditional on the formation. The results show that outsider's influence (such as NGO and local elites) matters, more diverse CCBs are more likely to be successful, and the leadership type and the land inequality matter. Section 5 concludes the paper with the directions for further research and policy implications.

2. DEVOLUTION AND CCB IN PAKISTAN

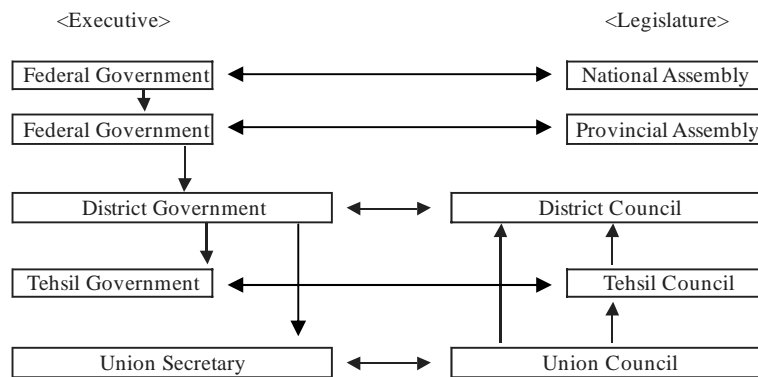
Pakistan is one of low income countries located in South Asia. Economic development in South Asia is characterised by a moderate success in economic growth with a substantial failure in human development such as basic health, education and gender equality [Dreze and Sen (1995)]. This characteristic is most apparent in Pakistan, as seen in country-level statistics reported by UNDP (2005): its GDP per capita is US\$555 in nominal term and PPP\$2097 in real term (the third place among the five major South Asian countries); life expectancy at birth for females is 63.2 years (the fourth place among the five South Asian countries); the combined gross enrolment ratio for primary, secondary and tertiary schools is 31 percent (bottom among the five South Asian countries). Underlying this situation is a society with unequal distribution of income and assets where the core network is based on familial, clan, and tribal relations, with limited historical experience in CBO-based cooperation in development efforts [JICA (2003)].

The current government led by Gen. Pervez Musharraf, which came to power after a military coup in October 1999, has been attempting to change this situation through two policy measures. The first is the *Devolution of Power* [Cheema, *et al.* (2006)]. Under this policy, the Local Government Ordinance (LGO) was promulgated in August 2001 and the first local government elections were held according to LGO in the same month. The term of those elected representatives ended in 2005 and the second elections were held in the same year.

The second policy measure is the *Poverty Reduction Strategy* based on the World Bank funded Poverty Reduction Strategy Paper (PRSP). The Government of Pakistan prepared its Interim PRSP in November 2001 and the Full PRSPs in December 2003. There are four pillars in the Full PRSP: accelerating economic growth; improving governance and devolution; investing in human capital; and targeting the poor and the vulnerable [Pakistan (2003)]. Devolution is listed as one of these four pillars and thus closely linked with poverty reduction policies in Pakistan.

Figure 1 shows the governance structure in Pakistan under the devolution initiatives. Devolution is designed in three spheres [GHK (2005); Cheema, *et al.* (2006)]. First, in the delivery of services and public goods by the government, the role of district bureaucracy has been enhanced in place of the provincial government, with the district government responsible for the service delivery in *tehsils* (sub-districts) and unions (smallest administrative units). Second, in the decision-making sphere, three-tier local bodies of elected representatives have been established, with District Nazim as the head of a district, Tehsil Nazim as the head of a tehsil, and Union Nazim as the head of a union. Third, in the financing sphere, direct budget allocations to districts and lower bodies have begun.

Fig. 1. Governance Structure in Pakistan under “Devolution”.



Source: Prepared by the author using government information and GHK (2005).

A *union* is the unit of local administration, monitored by a Union Council. It covers 5–20 villages/hamlets and a population of 10,000–25,000. A *Union Council* comprises 21 members elected by the local people, including four women’s seats, four peasant/worker households’ seats, two peasant/worker women’s seats, and one minority’s seat.² Union Nazim is the member of District Council. Union Naib-Nazim (sub-head of Union Council) is the member of Tehsil Council.

²This corresponds to the situation prevailing during the survey period, March–April 2005. In August 2005, LGO was amended, in which the number of Union Councilors was reduced from 21 to 13.

A Citizen Community Board (CCB) is a voluntary organisation based on the community in which people live. According to LGO, local people form a CCB with a chairman, a secretary, and general members. A registered CCB makes a proposal for development projects. The local government funds 80 percent of the total project cost. Since the promulgation of LGO in 2001, however, both the number of CCBs and the number of approved projects have been below the expected level [GHK (2005)]. Because a union is a too large unit for rural residents to organise collective action, the natural unit for villagers to initiate a CCB is a village. Therefore, the whole process for villagers to form a CCB and then to prepare a project proposal is regarded as *the collective action* examined below.

3. DATA AND EMPIRICAL MODELS

3.1. Dataset

To investigate the determinants of formation of a CCB and those of successful CCB development activities, primary datasets collected through the Devolution Support Project of the Japan International Cooperation Agency (JICA) are employed. The JICA project (2004–2006) is currently going on, focusing on preparing and implementing the CCB Improvement Plan in Hafizabad District, Punjab.

Hafizabad is a small district on the bank of Chenab River. It has 42 unions/towns and contains 428 villages/circles.³ The district was separated from Gujranwala District in 1993. The landscape is very flat throughout the district and the majority of farmland is irrigated. The main monsoon crop is Basmati rice and the main winter crop is wheat, both of which are cultivated simultaneously with various fodder crops for livestock, mostly cows and buffaloes (Table 1). Although the land is suitable for intensive cultivation in most parts of the district, areas close to Chenab River are vulnerable to frequent flood and erosion. Hafizabad is known as a typical Punjab society dominated by a few big landlords and numerous owner-farmers, with substantial landless rural population [GHK (2005)]. Agricultural census data also show that land tenancy in Hafizabad is more frequently found than in other parts of Punjab (Table 1).

As a benchmark survey, JICA implemented a socio-economic survey of Unions and CCBs in 2004–05 [RDPI (2005)]. Based on the benchmark survey results, the *Union Profile* covering all of 42 unions in Hafizabad and the *CCB Profile* covering all of 119 CCBs registered so far have been compiled. From the Union Profile, village-level information for 428 villages is obtained. Since JICA's CCB Improvement Plan in the field was initiated in October 2005, the datasets used in this paper show the situation *before* JICA's intervention.

³In urban areas, a town corresponds to a union (the smallest administrative unit) and a circle corresponds to a village. In the analysis below, a town or a union is called "union" and a village or a circle is called "village" for brevity.

Table 1

Characteristics of Agriculture in Hafizabad District, Pakistan (2000)

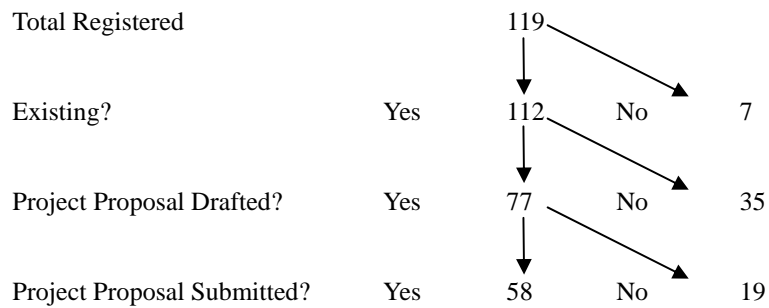
	All Punjab	Gujranwala Division	Hafizabad District
Average size of private farms (acres)	7.2	5.3	9.1
of which, cultivated area (acres)	6.6	5.0	8.7
Composition of private farms by numbers			
Owner farms (%)	78.6	86.0	66.5
Owner-cum-tenant farms (%)	11.0	8.5	14.1
Tenant farms (%)	10.4	5.5	19.4
Composition of private farms by farm areas			
Owner farms (%)	69.3	76.1	62.4
Owner-cum-tenant farms (%)	19.5	17.3	22.7
Tenant farms (%)	11.2	6.5	14.9
Importance of large farms (25 acres+)			
In terms of farm numbers (%)	5.1	2.4	6.8
In terms of farm acres (%)	31.1	18.1	31.3
Importance of very large farms (150 acres+)			
In terms of farm numbers (%)	0.13	0.03	0.11
In terms of farm acres (%)	4.16	1.16	2.59
Farms with their land irrigated 100%			
In terms of farm numbers (%)	76.5	75.0	97.9
In terms of farm acres (%)	66.9	77.5	92.5
Cropping pattern: % of total cropped area			
Wheat	41	42	41
Rice	11	35	38
Cotton	15	0	0
Sugarcane	3	2	1
Fodder Crops	13	13	16
Vegetables	2	1	1

Source: Pakistan (2001).

Note: Hafizabad District is one of the six districts included in Gujranwala Division.

At the time when the survey was ended (March 2005), 119 CCBs were registered. Three unions had no CCB. Some unions had more than one CCB. Twenty-five CCB projects were approved and only three schemes received funds. Total accumulated CCB fund in Hafizabad was Rs 121.8 m (approx. US\$ 2.5m).

Figure 2 shows the current status of 119 CCBs. Seven of them already disappeared and no information was obtained. From the remaining 112 CCBs, 77 drafted a project proposal and 58 submitted the proposal to the local government by the time of the survey. Major activities of the existing CCBs are listed in Table 2. Five areas stand by, with no single dominating activity: agriculture-related activities (items 1 and 2), rural infrastructure (items 3 and 4), health (item 5), education (items 6 and 7), and religious facilities (item 9). Those CCBs interested in micro credit (item 8) are mostly focusing on agricultural production loans so that this item is also related with agriculture. The CCBs with non-specified activities (items 10 and 11) are more likely to fail in preparing project proposals.

Fig. 2. Status of CCBs in March/April 2005.

Source: Prepared by the author using the JICA database (the same for the following tables).

Table 2

Major Activities of the Existing CCBs in Hafizabad

	All Existing CCBs		Those with Project Drafts		Those with Project Proposal Submitted	
	Nos	(%)	Nos	(%)	Nos	(%)
(1) Irrigation	3	(2.7)	3	(3.9)	3	(5.2)
(2) Agro centre for fertiliser and seed supply	13	(11.7)	13	(16.9)	11	(19.0)
(3) Roads and bridge construction	17	(15.3)	15	(19.5)	11	(19.0)
(4) Sewage, drainage, and gas pipeline	14	(12.6)	13	(16.9)	10	(17.2)
(5) Health facilities	19	(17.1)	19	(24.7)	16	(27.6)
(6) General education facilities	12	(10.8)	10	(13.0)	7	(12.1)
(7) Vocational training centre	13	(11.7)	12	(15.6)	9	(15.5)
(8) Micro credit	6	(5.4)	5	(6.5)	5	(8.6)
(9) Religious (prayer hall, graveyard wall, etc.)	17	(15.3)	16	(20.8)	10	(17.2)
(10) Non-specified "development"	20	(18.0)	3	(3.9)	1	(1.7)
(11) Activities unknown	11	(9.9)	0	(0.0)	0	(0.0)
Number of CCBs	111		77		58	

Notes: (1) The number of observations for "All existing CCBs" is 111 due to one observation with very incomplete information.

(2) Multiple responses were allowed so that the sum of the percentages (in parenthesis) exceeds 100 percent.

3.2. Empirical Models

Villagers organise collective action to form a CCB when their expected benefit from CCB registration is greater than its costs. Benefits and costs of such collective action depend on the village and union characteristics such as economic and political activities, infrastructure, and leadership [Meinzen-Dick, *et al.* (2002)]. Thus, the determinants of successful formation of a CCB are analysed by a village-level regression model:

$$\text{Prob}(Y_i=1) = f(X_k b_1 + X_i b_2 + u_i), \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

where Y_i is the dummy variable for village i to have a CCB, X_k is a vector of the characteristics of union k to which village i belongs, X_i is a vector of the village characteristics, b_1 and b_2 are vectors of parameters to be estimated, u_i is a zero-mean error term, and $f(\cdot)$ is a probit, logit, or linear function.

Once a CCB is formed, CCB members organise collective action to prepare a CCB project draft. To prepare the draft successfully, the members need to coordinate potentially conflicting interests among them and to satisfy technical specifications required from the local government as an acceptable proposal for fund allocation. Therefore, the success of such collective action can be modelled by a CCB-level regression model:

$$\text{Prob}(Y_j=1) = f(X_k b_1 + X_i b_2 + X_j b_3 + u_j), \quad \dots \quad \dots \quad \dots \quad (2)$$

where Y_j is the dummy variable for CCB j to organise collective action successfully (proposal drafted or submitted), X_j is a vector of the CCB characteristics (inequality, group size, heterogeneity, leadership, CCB rules, etc.). Empirical variables are summarised in Table 3.

Vectors of variables X_i and X_k are included in both Equations (1) and (2). If the dependent variables Y_i (CCB formation) and Y_j (CCB proposal preparation) capture the same collective action, we expect X_i and X_k to have coefficients with same signs across Equations (1) and (2). Instead, if the coefficients are different substantially, it is suggested that Y_i and Y_j capture different types of collective action. In this context, it should be noted that Y_j implies the commitment of the local people to pay 20 percent of the project cost. In theory, villagers can register a CCB without such commitment (or without any cooperation as an extreme case if a leader is able to collect a sufficient number of signatures required for CCB registration). This is like purchasing an option for CCB project proposals in the future, since there is no penalty on inactive CCBs. In contrast, once a project proposal is prepared and submitted to the local government, CCB members are required to bear 20 percent of the project cost. We therefore expect that more corporation among villagers is required for the dependent variable Y_j to be unity. In this sense, the project preparation may be a better proxy for collective action than the CCB formation. It is then an empirical question how the coefficients on X_i and X_k differ across Equations (1) and (2).

Table 3

Definition and Summary Statistics of Empirical Variables for CCB Analysis

Name	Definition	Mean	Std. Dev	Minimum	Maximum
Union-level Variables (NOB=42)					
<i>popden</i>	Population density in Union (nos/acre)	3.142	3.944	0.623	17.071
<i>d_rural</i>	Dummy for unions not belonging to a city "circle" with incomplete acreage data*	0.833	0.377	0	1
<i>litrte</i>	Adult literacy rates (%)	41.4	12.5	22.3	72.2
<i>schlden</i>	Number of schools per 1000 persons	1.353	0.360	0.799	2.341
<i>d_schl</i>	Dummy for unions not belonging to a city "circle" with incomplete school data*	0.810	0.397	0	1
<i>Lhwden</i>	Number of lady health workers per 1000 persons	1.353	0.858	0.272	4.218
<i>h_water</i>	Ratio of households with tap water	0.086	0.114	0.005	0.597
<i>d_bank</i>	Distance to the nearest bank branch (km)	6.143	5.449	0	20
<i>d_po</i>	Distance to the nearest post office (km)	1.000	1.835	0	8
<i>ucmeet</i>	Number of UC meetings held so far	5.357	4.047	0	20
<i>ngo</i>	Number of NGOs registered	1.143	1.280	0	5
Village-level Variables (NOB=406)#					
<i>d_ccb</i>	Dummy for having a CCB (dependent var.)	0.207	0.406	0	1
<i>popv_t</i>	Population of the village (1000)	1.945	2.580	0.055	17.972
<i>fnrate</i>	Female population/male population	0.921	0.064	0.670	1.172
<i>popv_mn</i>	Minorities population/total population	0.011	0.029	0	0.322
<i>infl</i>	Number of influential persons in the village	0.347	0.734	0	4
CCB-level Variables (NOB=111)					
<i>d_pdf</i>	Dummy for preparing a project proposal draft (dependent var.)	0.685	0.467	0	1
<i>d_subm</i>	Dummy for submitting a finalised project proposal (dependent var.)	0.514	0.502	0	1
<i>ccb_age</i>	Weeks since CCB registration	69.124	21.168	28	109
<i>num_mem</i>	Number of CCB members	25.532	1.808	20	38
<i>womenr</i>	Ratio of female CCB members	0.140	0.255	0	1.000
<i>d_meet</i>	Dummy for the regular meeting	0.748	0.436	0	1
<i>n_occp</i>	Number of occupations among members	4.788	1.939	1	12
<i>ineq_ed</i>	Inequality in CCB members' education (max schooling years–min schooling years)	12.231	2.256	6	16
<i>ineq_ld</i>	Inequality in CCB members' landholding (max acreage–min acreage) in 10 acres	2.793	2.959	0	25
<i>lead_sex</i>	Chairman's sex dummy (=1 if female)	0.135	0.343	0	1
<i>lead_age</i>	Chairman's age (years)	39.570	10.903	20	70
<i>lead_edy</i>	Chairman's schooling years	10.808	2.697	0	16
<i>lead_lnd</i>	Chairman's landholding in 10 acres	1.345	2.577	0	25
<i>miss_gen</i>	Dummy for the incomplete CCB records	0.324	0.470	0	1

Notes: # NOB is 406 after deleting marginal villages with population less than 50.

*When the acreage data or the number of schools are incomplete within a union, the information on the part with available data is extrapolated to other parts.

4. REGRESSION RESULTS

4.1. Determinants of CCB Formation

The estimation results of Equation (1) with function $f(\cdot)$ specified as the cumulative distribution function for a standard normal variable (i.e., a probit specification) are reported in the first two columns of Table 4. Among the village- and union-level variables except for those controlling for data quality (*d_rural*, *d_schl*), there are six variables with statistical significance (*popv_t*, *infl*, *litrte*, *schlden*, *d_bank*, *ngo*).

Table 4

Determinants of CCB Formation in a Village

	Probit Regression, Full Specification		Probit Regression, Parsimonious Specification		Linear Probability Model with Union Fixed Effects	
	dF/dX	(Std. Error)	dF/dX	(Std. Error)	Coef	(Std. Error)
Village-level Variables						
<i>popv_t</i>	0.067***	(0.018)	0.059***	(0.017)	0.075***	(0.011)
<i>fmrate</i>	-0.128	(0.285)			-0.189	(0.241)
<i>popv_mn</i>	-0.434	(0.659)			-0.432	(0.637)
<i>infl</i>	0.059*	(0.031)	0.059*	(0.031)	0.066*	(0.040)
Union-level Variables						
<i>popden</i>	-0.014	(0.019)			Union fixed effects are jointly significant at the 1% level.	
<i>d_rural</i>	0.044	(0.131)				
<i>litrte</i>	0.009***	(0.003)	0.004*	(0.002)		
<i>schlden</i>	-0.174**	(0.087)	-0.151*	(0.082)		
<i>d_schl</i>	-0.590*	(0.278)	-0.341	(0.320)		
<i>lhwden</i>	-0.103	(0.063)				
<i>h_water</i>	-0.135	(0.579)				
<i>d_bank</i>	0.020***	(0.006)	0.016***	(0.005)		
<i>d_po</i>	-0.017	(0.013)				
<i>ucmeet</i>	0.0002	(0.007)				
<i>ngo</i>	0.049**	(0.027)	0.057**	(0.025)		
Log Likelihood [R2]		-141.7986		-144.8081		[0.3493]
Chi2-stat [F] for zero slope		77.68 ***		70.68 ***		[5.59] ***

Note: The number of observation is 406. (2) The dependent variable is *d_ccb* (see Table 3). (3) Standard errors were Huber-White heteroscedastic robust ones (statistically significant at 1 percent***, 5 percent**, and 10 percent*). (4) “dF/dX” shows the marginal effect of the explanatory variable on the probability, evaluated at sample means (continuous variables), or the effect of the dummy explanatory variable on the probability when the dummy is increased from zero to one.

First, the village population (*popv_t*) is associated with CCB formation positively: an increase of the village population by one thousand raises the probability of CCB formation by 6.7 percent. This can be interpreted as a scale effect, not as a density effect, since the population density is also included in the model (insignificant). A related finding is the positive coefficient on the population’s literacy rate (*litrte*): an increase of the union’s adult literacy rate by one percentage points increases the probability of CCB formation by 0.9 percent. Thus the large size of literate population favours CCB formation.

Second, leadership matters at the stage of CCB formation, as suggested by positive and significant coefficients on *infl* (the number of influential persons in the village) and on *ngo* (the number of NGOs in the union). With one more influential person in the village, the probability of CCB formation increases by 5.9 percent, and with one more NGO working in the union, the probability of CCB formation increases by 4.9 percent. This confirms our field observations that NGOs are encouraging CCB formation at the grass root level and villagers turn to local influential persons for support when they begin something new. As the influential

persons in the village, people listed landlords, village heads, teachers, social workers, religious leaders, etc. Interestingly, the types of the influential persons did not yield a statistically significant difference. Furthermore, *ucmeet* (the cumulative number of Union Council [UC] meetings) is not significant at all. If UCs are effective in encouraging villagers to form a CCB, we expect the coefficient on *ucmeet* to be positive. The regression results does not support this, implying that the number of UC meeting is not related with CCB promotion.⁴

The factors discussed so far are determinants of the supply side of collective action in CCB formation. The demand side, i.e., the variables determining people's needs, has to be controlled for. Therefore, indicators for service delivery are included such as the number of schools, health workers, housing facilities, and the distance to banks and post offices. Among these variables, those with statistical significance have expected signs: villages in a union with fewer schools (*schlden*) and more difficulty in bank access (*d_bank*) are more likely to form a CCB.⁵

The results based on a logit specification⁶ are very similar to those reported in Table 4. When insignificant explanatory variables are deleted from the regression, the size and statistical significance of the six variables (*popv_t*, *infl*, *litrte*, *schlden*, *d_bank*, *ngo*) remain stable (see "parsimonious specification" in Table 4). To control for the omitted variable bias at the union level, a linear probability model with union fixed effects is estimated (the last columns of Table 4). The effects of the four village-level variables on CCB formation are very similar to those estimated by a probit model. Our results on the determinants of CCB formation are therefore highly robust.

4.2. Determinants of the Successful Preparation of a CCB Project Proposal

Once a CCB is formed, the next step is to prepare a proposal for CCB projects. Under what conditions, CCB members are successful in coordinating collective action that results in an acceptable project proposal? Estimation results based on Equation (2) with function $f(\cdot)$ specified as a probit are reported in Table 5. Before discussing the results, two remarks are given. First, as a robustness check, we choose two dependent variables: a dummy for the preparation of a project proposal draft and a dummy for the

⁴Or, the reverse causality may exist here: if more UC meetings on the subject of CCB promotion are held in a union with more difficulty in CCB formation, *ucmeet* and *d_ccb* may be negatively correlated. This possibility can be checked by investigating minute books of UC meetings, which is left for further research.

⁵It is possible that *d_bank* may capture the extent of commercialisation of the Union. In the literature on collective action (see Section 1), many authors have found that the extent of commercialisation is detrimental to cooperation. The positive effect of *d_bank* is consistent with this interpretation as well.

⁶The function $f(z) = e^z / (1 + e^z)$, where e is the base of natural logarithms, equal to approximately 2.7183.

Table 5

Determinants of the Preparation of a Project Proposal Conditional on CCB Formation (Probit Regression Results)

	“ <i>d_pdfi</i> ” (Dummy for the Preparation of Project Proposal Draft)				“ <i>d_subm</i> ” (Dummy for the Submission of Project Proposal)			
	dF/dX	(Std.Error)	dF/dX	(Std. Error)	dF/dX	(Std. Error)	dF/dX	(Std. Error)
CCB-level Variables								
<i>ccb_age</i>	0.004**	(0.002)	0.003	(0.002)	0.007**	(0.003)	0.007**	(0.003)
<i>num_mem</i>	0.023	(0.022)	0.024	(0.023)	−0.116*	(0.060)	−0.113*	(0.060)
<i>womenr</i>	(omitted due to m.c. with <i>lead_sex</i>)		−0.115	(0.206)	(omitted due to m.c. with <i>lead_sex</i>)		−0.194	(0.240)
<i>d_meet</i>	0.753***	(0.099)	0.579***	(0.114)	0.627***	(0.076)	0.619***	(0.079)
<i>n_occp</i>	0.046**	(0.024)	0.075**	(0.027)	−0.026	(0.030)	−0.027	(0.032)
<i>ineq_ed</i>	0.017	(0.023)	−0.010	(0.030)	0.001	(0.028)	0.004	(0.029)
<i>ineq_ld</i>	0.005	(0.018)	(omitted due to m.c. with <i>lead_ld</i>)		−0.040**	(0.020)	(omitted due to m.c. with <i>lead_ld</i>)	
<i>lead_sex</i>	−0.032	(0.151)	(omitted due to m.c. with <i>womenr</i>)		−0.128	(0.185)	(omitted due to m.c. with <i>womenr</i>)	
<i>lead_age</i>	0.014**	(0.006)	0.007	(0.005)	0.006	(0.006)	0.004	(0.006)
<i>lead_edy</i>	0.002	(0.017)	0.003	(0.018)	−0.004	(0.021)	0.000	(0.021)
<i>lead_ld</i>	(omitted due to m.c. with <i>ineq_ld</i>)		0.081*	(0.045)	(omitted due to m.c. with <i>ineq_ld</i>)		−0.034*	(0.020)
<i>miss_gen</i>	−0.353***	(0.115)	−0.420***	(0.099)	−0.161	(0.124)	−0.158	(0.124)
Village-level Variables								
<i>popv_t</i>	0.013	(0.012)	0.011	(0.011)	−0.034*	(0.019)	−0.029	(0.019)
<i>infl</i>	(omitted due to “perfect prediction”)		(omitted due to “perfect prediction”)		0.030	(0.073)	0.026	(0.074)
Union-level Variables								
<i>lirate</i>	0.019***	(0.006)	(omitted due to “perfect prediction”)		0.029***	(0.009)	0.029***	(0.009)
<i>schlden</i>	0.015	(0.172)	−0.049	(0.157)	0.265	(0.210)	0.267	(0.205)
<i>d_bank</i>	0.034***	(0.013)	0.003	(0.013)	0.028*	(0.017)	0.029*	(0.018)
<i>ngo</i>	0.042	(0.051)	0.027	(0.053)	0.154**	(0.065)	0.142**	(0.065)
Log Likelihood	−31.237		−34.950		−47.463		−48.107	
Chi2-stat for zero slope	121.14 ***		77.12 ***		40.49 ***		40.49 ***	

Notes: (1) The number of observations is 111 (see Table 3). (2) Expression “m.c.” in “omitted due to m.c. with xxx” is short for “multicollinearity”. (3) and (4) see Table 4.

submission of the proposal. As shown in Figure 2, submission is conditional on the draft preparation. In this sense, it may be desirable to estimate a model of sequential decision-making. As the first step to approach the desirable model, Equation (2) is estimated for each of these dependent variables with the same explanatory variables. In other words, a completely reduced-form approach is adopted. Second, since the number of observations is rather small, the degree of freedom is low, which makes the estimation of (2) vulnerable to multicollinearity problems. Among the CCB-level explanatory variables listed in Table 3, two pairs have very high correlation coefficients (more than 0.8). One is correlation between *womenr* (the ratio of female CCB members) and *lead_sex* (a dummy for a female chairman) and the other is correlation between *ineq_ld* (inequality in CCB members' landholding) and *lead_lnd* (chairman's landholding). This is natural in the environment in the study area where a CCB chairman represents the upper stratum of CCB members. To avoid the multicollinearity problems due to the high correlation of these variables, only one each from the two pairs is included in the estimated model. This is the limit of the current dataset. With more degrees of freedom, effects of *ineq_ld* (through inequality) and *lead_lnd* (through leadership) could have been estimated simultaneously. A related problem is that we cannot include a full set of village- and union-level variables because the inclusion leads to the "perfect prediction" of the dependent variable for a number of observations. Therefore, we limit the number of village- and union-level variables among those significant in Table 4 and drop some of the variables when they are responsible for the perfect prediction.

The estimation results show that among the village- and union-level variables retained, those with statistical significance have the same sign as in Table 4. Residents' literacy (*litrte*) and the union's disadvantage in the access to banks (*d_bank*) both increase the probability of successful preparation and submission of a CCB project proposal. The presence of NGO (*ngo*) increases the probability but the effect is statistically significant only at the stage of proposal submission. Union-level variables are mostly insignificant.

Among CCB-level variables, several variables have coefficients that are congruent across specifications. First, the collective action for project finalisation takes time: *ccb_age* has a positive coefficient, which is statistically significant in three out of the four specifications in Table 5. An increase of CCB age by one week raises the probability of CCB project submission by 0.7 percent.

Second, CCB's management and rules matter. Those CCBs holding a meeting regularly (*d_meet*) are more likely to prepare a draft and to submit the proposal (the probability of proposal submission increases by more than 60 percent); those CCBs not recording their activities properly (*miss_gen*) are less likely to prepare a draft (the probability decreases by 35 or by 42 percent) and to submit the proposal (the probability decreases by 16 percent), though the latter effect on the submission was statistically significant only at the 20 percent level.

Third, the group size (*num_mem*) and the number of occupations among members (*n_occp*) have positive coefficients on proposal preparation and negative coefficients on proposal submission. Among them, the positive effect of *n_occp* on the preparation and the negative effect of *num_mem* on the submission are statistically significant. The negative effect of the member size is consistent with the findings in the majority of studies on collective action in irrigation management [Bandiera, *et al.* (2005); Wade (1988); Bardhan (2000); Dayton-Johnson (2000)]. Positive and significant effects of *n_occp* (the number of occupations among members) on the preparation of project proposals are against the findings in the literature that the social heterogeneity among members is detrimental to collective action [Wade (1988); Bardhan (2000); Dayton-Johnson (2000)]. The regression result seems to suggest that the superiority in technical skills of more heterogeneous CCBs surpasses the disadvantage of such CCBs in terms of maintaining cooperation. In this sense, the regression result shows the lack of technical support from the CCB administration in preparing project proposals. However, at the stage of proposal submission, *n_occp* has a negative and insignificant effect on collective action, suggesting a possibility that the ill effect of *n_occp* appear at this stage that requires more coordination among CCB members because the submission of the proposal implies the official commitment of local people to pay 20 percent of the project cost.

Inequality in land holding among CCB members (*ineq_ld*) seems detrimental to the submission of the proposal although its effect is only marginally significant in the statistical sense. It may also capture the effects of the leadership through land holding (*lead_ld*). The coefficient on *lead_ld* is positive on *d_pdf* but negative on *d_subm*, both of which are statistically significant at the 10 percent level. The effect of *ineq_ld* on *d_pdf* is also positive, though not statistically significant. This suggests a possibility that the effect of land inequality on collective action may differ depending on the stage of project preparation. This requires further research since the results here are weak and mixed.

Unexpectedly, all of CCB-level variables related with education and gender are insignificant in all specifications. The coefficients on education variables (leader's education as well as member's inequality in education) have large standard errors. The coefficients on *womenr* (the ratio of female CCB members) and *lead_sex* (a dummy for a female chairman) are negative, indicating that a CCB with more female presence is disadvantaged in preparing projects. This is as expected in the context of Pakistan. However, these effects are far from statistically significant. The marginal effects estimated are very small. Therefore, these results show that the disadvantage of female-dominated CCBs is not discernible, which is a good sign.

The results based on a logit specification are very similar to those reported in Table 5. The deletion of insignificant explanatory variables from the regression does not change the empirical findings qualitatively. The effects of union- and

village-level variables are not so robust, however, depending on which of these semi-macro variables are retained. Nevertheless, changing the union- and village-level variables does not change the size and signs of CCB-level variables with statistical significance reported in Table 5.

5. CONCLUSION

This paper estimated the determinants of collective action among Pakistani villagers using a cross-section micro dataset. The determinants of successful formation of a CCB (a kind of community based organisation promoted by the government) were estimated using a village-level probit model. The results showed that villages with more literate population are more likely to form a CCB, the presence of NGOs in the union and influential persons in the village raises the probability of CCB formation, and villages with less access to schools and financial institutions are more likely to be successful in forming a CCB. The determinants of successful preparation of CCB development projects conditional on the CCB formation were estimated using a CCB-level probit model. The results showed that older CCBs, CCBs with more strict management (regular meetings and record-keeping), CCBs with more technical skills (diversity in members' occupation) are more likely to prepare a project proposal draft and to submit the proposal to the local government. The effects of education, gender, and inequality on the project success probability were not clearly discernible, although a negative effect of land inequality on project submission was found. This study thus seems to show that CCB-based collective action is possible even in the Pakistani society where the core network is not based on local residential areas, under the condition with favourable factors found in the regression analysis.

One caveat of these findings is that interpreting them as showing the mechanism of collective action through CCB may not be warranted for several reasons. First, the causality may be opposite for several variables. For example, regular CCB meeting could be a result of active preparatory work for a CCB project. Second, CCBs are formed endogenously so that group size, number of occupations among members, leader's characteristics, etc. are the results of endogenous matching, and, record keeping and regular meetings are the results of endogenous formation of CCB rules. To elicit the true causal effects of these CCB characteristics on CCB performance, we need exogenous variation, which is lacking in the current dataset. Third, the regression results reported in this paper may be subject to the omitted variable bias. For example, within-village inequality among non-CCB members (but potential beneficiaries of a CCB project) may be a factor in determining the success of the CCB project. For these reasons, the regression results reported in this paper are only suggestive.

Despite the caveat, we can extract from these regression results several lessons for CCB promotion policies. First, the policies should collaborate with NGOs and local

influential people more closely. On the other hand, when administration itself targets at unions and villages directly, those without NGOs should be given high priority. Second, support to female-dominated CCBs is required and will be effective, considering the regression result that some female-dominated CCBs are successful, indicating that female-dominated CCBs are feasible under favourable conditions. Third, the inside management of a CCB has to be monitored rigorously. Holding a CCB meeting regularly and keeping activity records properly are an effective way to create more successful CCBs. Fourth, technical support to CCBs in preparing project proposals is required, considering the regression result that the occupational heterogeneity within CCBs is associated with more success in CCB project preparation. Since the occupational heterogeneity is usually detrimental to collective action, the regression result seems to suggest that the superiority in technical skills of more heterogeneous CCBs surpasses the disadvantage of such CCBs in terms of maintaining cooperation. Therefore, technical support in preparing project proposals should be provided with more efficiency from the CCB administration.

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