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**PLACEMENT AND OUTREACH OF GROUP-BASED CREDIT
ORGANIZATIONS: THE CASES OF ASA, BRAC, AND PROSHIKA IN
BANGLADESH**

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ABSTRACT

Bangladesh has witnessed major strides in providing financial services to the rural poor. These services are provided largely through innovative group-based credit programs of several nongovernmental organizations. The implicit but widespread assumption has been that they are indeed placed in special poverty-stricken areas. Is this assumption valid? If not, what factors actually affect programs' placement across communities? This paper uses an unique *thana*-level data set to analyze the placement of three group-based credit programs in Bangladesh. Analysis of branch placement indicates that, unlike commercial banks, nongovernmental institutions do respond to general conditions of poverty. However, it appears that NGO services are located more in poor pockets of relatively well-developed areas than in remoter, less-developed regions. Client density of the established branches, however, did not exhibit such a feature and actually tended to be better in less advantageous locations.

CONTENTS

Acknowledgments	vii
1. Introduction	1
2. The Institutions	3
Association for Social Advancement (ASA)	4
Bangladesh Rural Advancement Committee (BRAC)	4
Proshika Manobik Unnayan Kendra (PROSHIKA)	5
3. Factors Affecting the Placement of Branches	6
Analytical Framework	6
Poverty Targeting	8
Expected Level of Demand for Credit Services	10
Cost of Supplying Services	11
Perceived Riskiness	12
4. Econometric Specification	13
5. Econometric Results: Placement of Branches	17
All NGOs	17
NGO-Specific Equations	19
6. Econometric Results: Client Coverage	23
7. Conclusions and Policy Recommendations	27
References	33

TABLES

1	Definition and descriptive statistics of regression variables: <i>Thana</i> level (n = 391)	16
2	Placement of all NGOs: Estimated fixed-effects logit equation	18

3	Placement of ASA: Estimated fixed-effects logit equation	20
4	Placement of BRAC: Estimated fixed-effects logit equation	20
5	Placement of PROSHIKA: Estimated fixed-effects logit equation	20
6	Outreach equation: BRAC and ASA	25
7	Outreach equation: ASA	28
8	Outreach equation: BRAC	28
9	Outreach equation: PROSHIKA	28

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1. INTRODUCTION

In recent years, Bangladesh has witnessed major strides in delivering financial services to the rural poor. The providers of these services have mainly been innovative group-based credit programs run by several nongovernmental organizations (NGOs). A number of studies are now available that describe how these new institutional arrangements dispensed with physical collateral and facilitated access of the poor to savings and credit services (Zeller, Sharma, and Ahmed 1996; Hossain 1988). However, only scant attention has so far been given to the determinants of the *placement* of branch NGO institutions and the client coverage of their operations across regions. Khandker, Khalily, and Khan (1995) find that commercial banks in Bangladesh favor well-endowed areas, and a study in India (Binswanger, Khandker, and Rosenzweig 1993) concluded that commercial banks were more likely to be located in places where the road infrastructure and marketing system are relatively developed. Is this also the case with group-based credit systems of NGOs? In other words, do NGO programs target their services to the poor in relatively underdeveloped or disadvantaged regions or do they locate their branches in the relatively better endowed areas? What kinds of tensions arise between organizational goals and performance standards and/or requirements at the operations level? Once branches have been placed, what does client coverage look like across branches? For example, do the decisions on branch placement and client coverage follow similar patterns, or is there evidence of discontinuity? To what extent does the decision

related to client coverage appear to be decentralized (Ravallion and Wodon 1997)? Knowing whether certain types of areas are systematically favored or disfavored is of interest and importance to policy makers as well as to program managers. This knowledge can also assist in disentangling program effects from location effects and hence is useful for an assessment of the impact of group-based credit programs (Pitt, Rosenzweig, and Gibbons 1995).

This paper makes use of secondary level data from 391 administrative units termed *thanas*¹ to examine the placement of branches and group coverage of three well-known NGO credit institutions in Bangladesh: Association of Social Advancement (ASA), Bangladesh Rural Advancement Committee (BRAC), and Proshika Manobik Unnayan Kendra (PROSHIKA). In Section 2, major characteristics of these NGO institutions are described (see Zeller, Sharma, and Ahmed [1996] for more detail). Section 3 first outlines a framework for analyzing placement decisions of Bangladeshi NGOs and then goes ahead to propose a number of hypotheses on placement of branches that were tested econometrically. Results on branch placement are presented in Section 4, while those on client coverage are presented in Section 5. The last section summarizes findings and policy implications. The study concludes that because the multiple objectives of the NGOs introduces considerable tension in service placement decisions of NGOs,

¹For administrative purposes, Bangladesh is divided into four divisions and 64 districts. Each district is further divided into *thanas*. A *thana* is an administrative unit that corresponds with the jurisdiction of a police station.

organizational innovations that reduce such tensions will serve to strengthen institutions.

A number of specific recommendations are made in this regard.

2. THE INSTITUTIONS

There are five common threads that weave around the institutional structures of the ASA, BRAC, and PROSHIKA. First, services are strictly targeted to a well-defined set of clients: the most common criterion is the amount of land owned and all three NGOs target landless or near-landless households. Second, credit is always provided to small groups of borrowers on the basis of joint liability and without the pledging of any physical collateral. Third, even though loans are made out to individual members, the entire group is denied further credit when outstanding arrears exist for any one of the members.

Fourth, lending activities are supplemented by training activities in areas ranging from entrepreneurial skill development, management of microenterprises like shopkeeping, and crafts production, to education on social awareness and family planning activities. Fifth, groups are required to contribute to an emergency fund that may be used when members experience household and other emergencies.

Loan recovery rates of all three institutions are impressive when compared with those of commercial banks. During the period 1992-93, for example, they were 100 percent for ASA, 98 percent for BRAC, and 93 percent for PROSHIKA. Additional institution-specific details are as follows.

ASSOCIATION FOR SOCIAL ADVANCEMENT (ASA)

ASA, one of the largest indigenous NGOs in Bangladesh, was set up in 1978. It implements programs in the areas of income generation, integrated health, and education and empowerment of the poor and its Income Generation through Credit Program (IGCP) was launched in 1989. The principal objective of the program is to increase income levels and purchasing power of the poor households. ASA extends credit facilities to the female members of the poor households for investment in various income-generating activities. The major income generating activities receiving support under the IGCP program are paddy husking, cow/goat rearing, poultry farming, small trading, and handicrafts. Nearly 190,000 members received loans under the program in 1993.

BANGLADESH RURAL ADVANCEMENT COMMITTEE (BRAC)

BRAC was set up in 1972, following the independence of the country in 1971. At its birth, the primary goal of BRAC was to participate in the post-independence rehabilitation work of the war-ravaged country. It launched its campaign with a small rehabilitation project in Sylhet district in the northeast of Bangladesh. Gradually, BRAC expanded its operation to other parts of the country. BRAC initiated its credit program in 1976 (BRAC 1991). The present form of the program, which was introduced in 1990, is known as the Rural Credit Project (RCP). RCP is an important component of BRAC's larger Rural Development Project (RDP). The objectives of RDP are fourfold: (1) to generate employment opportunity for both males and females, (2) to mobilize under- and

unutilized resources, (3) to assist in diffusing appropriate technology in the rural areas, and (4) to promote better health care. The cumulative amount of loan disbursed through RCP from 1990 through 1992 stood at Tk 1,745 million and during 1992, short-term loans accounted for 94 percent of total disbursement. Loans are generally extended for a specified line of projects. In 1992, for example, rural trading and food processing accounted for nearly 73 percent of the loans. Livestock, agriculture, rural industry, and irrigation accounted for another 23 percent. As of June 1993, 70 branches of RCP were in operation with a coverage of 379,000 members.

PROSHIKA MANOBIK UNNAYAN KENDRA (PROSHIKA)

PROSHIKA was founded in 1976 with the aim of empowering the poor by enabling them to participate in mainstream economic activities. Its objectives include achieving structural poverty alleviation, improving status of women, and increasing people's participation in public institutions. PROSHIKA operates group saving and revolving loan fund activities under its Employment and Income Generating (EIG) program. The revolving loan fund program, launched in 1983, and funded 10,809 projects with total fund disbursed amounting to nearly Tk 224 million in the 1992/93 financial year.

3. FACTORS AFFECTING THE PLACEMENT OF BRANCHES

ANALYTICAL FRAMEWORK

When guided by the sole objective of maximizing profits, the decision to place a branch in a particular location is relatively straightforward, as it can be based on standard cost theory: it makes sense to open an additional outlet whenever projected marginal revenue from a new service center is at least as high as the total cost of establishing the branch. Of course, this decision may be additionally complicated by whether the organization entering in the market is big enough to influence prices. Also, before resources are committed, the firm is free to choose the scale of operations based on its knowledge of expected demand conditions, and this decision will affect the unit cost of supplying services. Once a branch is opened—that is, once resources are committed, and the scale of operation fixed, the service volume in the short run (during the time in which scale is fixed) is provided such that marginal revenue equals marginal cost (now composed of two components: one that is fixed and the other that is variable). Of course, possibilities of expanding the scale of operations in the future remains: this decision would depend on expected changes in the demand for services, and the extent to which moving onto a larger scale of operation brings about substantial reduction in unit costs of providing services. The organization is also free to shut down the branch: this it will do if average revenue does not cover average variable costs.

Can the above framework be applied to analyze placement and outreach decisions of the Bangladeshi NGOs? The answer is in the negative, mainly because profit making is

not a principal aim of these organizations. We outline two important considerations that are likely to affect branch placement and client outreach decisions of the NGOs. First, as indicated in an earlier section, all the three NGOs came into being principally as a response to the challenge of delivering basic social services to an impoverish population further destituted, at that time, by a devastating war of liberation. The management decision within these organizations were/are therefore primarily responsive to goals underlined in the original mission or the charter under which these institutions were established. Second, the original mission is likely to be modified by at least another important consideration: the interest represented by the principal financiers of the institutions, composed of international as well as national donors. All three NGOs received and/or continue to receive funding from such sources and, by implication, are likely to be bound by any conditionalities accompanying such arrangements. We argue that these conditionalities relate primarily to maintaining some minimum standards of financial performance (e.g., caps on delinquency rates and administrative costs) and demonstrating some minimum level of positive program impact. Below, we propose that fulfilling original organizational objectives as well as conditionalities imposed by financiers result in four specific considerations in branch placement and client coverage: (1) poverty targeting, (2) expected demand for services, (3) cost of supplying services, and (4) perceived riskiness in operations. An econometric model incorporating these considerations is specified and then tested in subsequent sections.

The placement rule followed by NGOs is specified in equation (1), where the decision to place a branch, B_i , by an NGO credit institution is specified as a function of

$$B_i = f(P_i, E(D_i), E(C_i), R_i), \quad (1)$$

where P_i is a vector that describes poverty conditions in *thana* i , $E(D_i)$ is the expected level of demand for credit services in that *thana*, $E(C_i)$ is the expected level of cost of providing services, and R_i is an index of the riskiness of conducting credit-related business in the *thana*. Each of these are discussed below.

Poverty Targeting

All three NGOs, who are among the largest in the micro-finance NGO movement in Bangladesh (Credit and Development Forum 1996), claim to be guided, first and foremost, by a common mission to serve the poorest in the rural areas (ASA 1996a, 1996b; Lovell 1992; BRAC 1994). ASA, which provides credit exclusively to women, for example, aims at creating "a broader space for marginalized women of rural areas as they can participate in income generation activities to increase income" ASA (1994, p. 4). BRAC, on the other hand, aims to work "exclusively with disadvantaged sections of the community" (Chowdhury, Mahmood, and Abed 1991, p. 4) and focuses on poor landless groups, and PROSHIKA has an explicit mission to "empower the poor" (Jahangir and Zeller 1995). Given these kinds of mission statements, a reasonable hypothesis is that,

conditional upon other factors, *thanas* with higher poverty levels will have a higher probability of a branch placement.

There are, however, two additional questions: (1) What criteria of poverty do these institutions apply with respect to *individuals* in targeting their operations; (2) What criteria do these institutions apply in making the operational decisions on which *areas* to target their activities. The answer to the first question is relatively straightforward. All three programs have clear and strict poverty-based eligibility rules that are well-enforced. BRAC lends only to those who own less than 0.5 acres of land and additionally works as a laborer for at least 100 days in a year (Lovell 1992). ASA, on the other hand, lends to women owning less than 0.5 acres of land and whose income does not exceed Tk 1,200 per month and who also sells her labor for at least 200 days a year. However, the response of NGOs to the large differences in poverty levels between different locations in making the decisions about placement of their branches is a more difficult question. A reasonable assumption is that the NGOs base their decisions on various types of indicators of poverty. One testable hypothesis is that NGOs locate their branches in *thanas* that have larger proportions of households owning less than 0.5 acres of land—as this criterion most closely defines their target households. This need not be the only criterion, however. Two hypothesis explore other criteria. Two additional criteria are proposed in this study: *thana*-wise literacy rates and *thana*-wise levels of "distress" index developed by the Helen Keller Institute (HKI) in Dhaka, Bangladesh (Helen Keller International 1994), in operationalizing the vulnerability-focus of its program. Literacy rates generally highly

correlate with poverty levels, and the HKI distress index combines information on susceptibility to flooding (a frequently occurring natural disaster in Bangladesh), general wage levels, and availability of irrigation facilities—all being major factors affecting the level of well-being in Bangladesh.

Expected Level of Demand for Credit Services

The expected level of demand for credit services in an area is likely to receive important consideration for two reasons. First, it would be important for the NGOs to avoid areas where credit demand is likely to be either nonexistent or lower than some minimum threshold that makes credit delivery prohibitively costly to administer. Second, the marginal impact of NGO services on participating households, a major concern for the NGOs, is likely to be the highest in areas with the strongest credit demand. This is because credit demand is likely to be the strongest in areas that are affected relatively less by other accompanying constraints—on labor and product markets, transportation, and information. Hence, expected demand for credit is expressed as

$$E(D_i) = g(W_i), \quad (2)$$

where the vector, W_i , consists of *thana*-level variables that affect the level of credit demand and may include the following variables:

- level of physical infrastructural development such as access to markets, roads, electricity, irrigation, and other services;
- agroclimatic conditions and general income levels; and
- level of urbanization and commercialization of the local economy.

Cost of Supplying Services

As indicated before, while profit-seeking institutions select locations where expected revenues are at least as high as expected total cost, this may not necessarily be the case of NGOs, as they do not have profit maximization as their explicit objective. Further, NGOs receive subsidies of different types to operate in specific geographical areas and also implement various types of cross-subsidization schemes between branches. For this reason, they are not likely to base their placement decision solely on potential *net* revenues. How expected unit costs operation affects placement of branches, hence, is essentially an empirical issue.

But there are at least two other cost-related issues that are likely to be important in the placement calculation. These concern general security operations and the availability of banking services. Credit transactions necessarily involve handling of cash, raising security concerns. Proximity to police stations and other law and order establishments may therefore be important. Moreover, when NGOs do not provide their own banking services but depend on the branch of a commercial or parastatal bank to make cash disbursements and deposits, then proximity to commercial banks becomes important. If

commercial banks are generally located in areas that are more urbanized or benefit from better infrastructure (as Binswanger, Khandker, and Rosenzweig [1993] have shown), then NGOs may also tend to place branches in or near these locations.

A third issue relates to staffing of branches. Since branch managers are recruited from a central pool, and since salaries and other compensations do not reward appointments in more remote locations, managers are likely to prefer locations that have fairly well-developed services (education, market, health). If these considerations are significant in the decision to place branches, placement will be higher in *thanas* that have such services.

To account for all these consideration, we let the expected total cost function be specified as

$$E(C_i) = g(Z_i) ,$$

where the vector, Z_i , consists of *thana*-level variables that affect the level of unit service delivery costs. In practice, vectors W_i in equation (2) and Z_i are likely to be very similar if not identical.

Perceived Riskiness

An important goal of NGOs administering credit programs is to maintain high repayment rates. Indeed, as noted earlier, all NGO programs report repayment rates in excess of 90 percent. Maintaining near-perfect repayment rates is critical for NGOs. This

is because most of the subsidies they receive from national and international donors appear to be conditional on maintaining such rates. This objective of maintaining high repayment rates² may also affect the placement of branches. In particular, NGOs are likely to avoid areas where marginal returns from new microenterprises are low (poor, backward areas where complementary services either do not exist or are highly inadequate). They are also likely to avoid areas that are highly susceptible to natural disasters such as flooding and other covariate risks. We let the risk expectation function be specified as

$$E(C_i) = g(V_i). \quad (4)$$

Elements in V_i include poverty indicators such as literacy rate, level and distribution of landholding, and also the HKI distress level indicator described earlier.

4. ECONOMETRIC SPECIFICATION

A linear specification of the placement equation (1), upon substituting for equations (2)-(4), would be

$$B_i = N_i\alpha + W_i\beta + Z_i\gamma + V_i\delta. \quad (5)$$

However, as indicated in the previous section, it is in principle (and also due to data limitations) very difficult to identify N , W , Z , and V *separately*. For example, it is very

² Note that repayment rate is distinct from net financial returns. In the presence of subsidies, net revenues may be negative even when repayment is 100 percent.

difficult to find variables that affect poverty levels but not credit demand or riskiness of conducting business. A more practical formulation is therefore to regard the elements in N , W , Z , and V to be common and represented by the vector X_i , as

$$B_i = \sum \eta_i X_i + \mu_d + e_i \quad (6)$$

and interpreting its coefficient, $\eta_i = (\alpha_i + \beta_i + \gamma_i + \delta_i)$, as the combined effects of the four determinants of placement. After all, infrastructure, urbanization, and other community-level endowments are likely to jointly affect levels of poverty as well as demand for credit services, the cost of credit service delivery, and the riskiness of conducting business.

Similarly, susceptibility to natural disasters simultaneously affects poverty, credit demand patterns and the riskiness and costs of doing business. Note that a priori expectations on the sign of η_i are difficult to place unless α_i , β_i , γ_i , and δ_i are of the same expected signs. However, it is possible to make inferences based on the signs of the estimated coefficients on the relative strengths of some subset of the variables. This is Section 4.

A different consideration is the effect of unobservables. If placement of government infrastructural programs as well as levels of poverty are functions of unobservable factors such as agroclimatic potentials of lands, historical or political considerations, then exclusion of such factors in equation (6) is likely to lead to biased estimates of the η s. In order to minimize bias arising out of location-specific unobservables, a district level of effect μ_d is included in equation (6). Since B_i in equation (6) is a binary dependent variable taking the value of one whenever there is a branch of the NGO in a *thana* and zero

otherwise, the equation is estimated using the fixed effects logit estimation that sweeps out the effects of district-level unobservables.

The vector \mathbf{X} in equation (6) contains the following variables (See Table 1 for descriptive statistics).

Poverty-related variables	
LANDSIZE	The percentage of farms in the <i>thana</i> that are below 0.5 acres in size
LITERATE	The percentage of population literate in the <i>thana</i>
Infrastructure-related variables	
ELECTRICITY	The percentage of villages electrified in the <i>thana</i>
MARKET	The number of market centers in the <i>thana</i>
DENSITY	The population density of the <i>thana</i>
URBAN	The percentage of urban population in the <i>thana</i>
ROAD	The kilometer of metaled road per 1,000 persons in the <i>thana</i>
HOSPITAL	The number of population per hospital bed in the <i>thana</i>
DOCTOR	The number of population per doctor in the <i>thana</i>
POSTOFFICE	The number of post offices in the <i>thana</i>
Risk/Poverty-related variable	
DISTRESS	The <i>thana</i> -wise distress index computed by the Helen Keller Institute

All data, except for the distress level, which has been directly obtained from Helen Keller International in Dhaka, are published in various issues of the statistical yearbook of Bangladesh, Bangladesh Bureau of Statistics (1994). Data on the dependent variables for the different programs have been obtained from annual reports from BRAC, ASA, and the Grameen Bank for 1994 (BRAC 1994; ASA 1994; Grameen Bank 1994). The data for PROSHIKA also refers to 1994, and were obtained through interviews with staff from its headquarters in Dhaka.

**Table 1 Definition and descriptive statistics of regression variables: *Thana* level
(n = 391)**

Variables	Mean	Standard Deviation	Minimum	Maximum
Dependent variables				
Presence of NGO ^a	0.40	0.49	0.00	1.00
Presence of ASA ^a	0.10	0.31	0.00	1.00
Presence of BRAC ^a	0.24	0.43	0.00	1.00
Presence of PROSHIKA ^a	0.13	0.33	0.00	1.00
Client density (all) ^b	17.86	33.01	0.00	297.59
Client density (ASA) ^b	1.94	6.35	0.00	39.80
Client density (BRAC) ^b	9.35	24.45	0.00	297.59
Client density (PROSHIKA) ^b	6.57	19.95	0.00	155.99
Independent Variables				
Years of operation (BRAC)	1.46	3.33	0.00	18.00
Years of operation (ASA)	0.41	1.33	0.00	7.00
ELECTRICITY	6.96	8.47	0.00	54.90
LANDSIZE	23.90	7.60	1.97	52.87
LITERATE	24.54	9.94	11.0	60.4
MARKET	26.22	13.37	1	75
DENSITY	791.10	666.54	93.20	10,557.35
URBAN	11.26	16.58	0.00	100.00
ROADS	0.17	0.21	0.00	2.61
POSTOFFICE	16.18	9.69	1	82
HOSPITAL	12,576.33	11,499.45	0	99,726
DOCTOR	42,905.03	44,555.82	0	329,739
DISTRESS	1.1	0.15	1.0	1.5

Source: Statistical Yearbooks (various issues), Bureau of Statistics, Dhaka; BRAC Statistical Report, RDP and RCP 1989-1993; ASA Annual Report 1994; Grameen Bank Annual Report 1994; data for PROSHIKA obtained in interviews from Head Office; Helen Keller International, Dhaka (for distress index only).

^a Dummy variables.

^b Client density is defined as the number of NGO clients in the *thana* divided by the *thana*'s population.

5. ECONOMETRIC RESULTS: PLACEMENT OF BRANCHES

Placement of branch equations were estimated for all the three NGOs taken together and for each separately. These are discussed below.

ALL NGOS

The estimated logit equation where the dependent variable takes on a value of one when a branch of at least one of the three NGOs exists in the *thana* and zero otherwise is presented in Table 2. A number of interesting results are discussed below. The coefficients of ROAD and POSTOFFICE are positive and significant at the 5 percent level. These are both infrastructural variables measuring the extent of transportation and communication facilities in the *thana*. The percentage of urban population in the *thana* (URBAN) and population density (DENSITY) are not statistically significant. Neither are the two health service indicators (HOSPITAL) and (DOCTOR), the number of market centers in the *thana* (MARKET), or the percentage of villages that are electrified in the *thana* (ELECTRICITY). It appears therefore that placement decisions are attentive to transportation and communication facilities, but that the **net** effect of other infrastructural facilities measured or proxied by population concentration, urbanization, and the availability of medical and health services appears to be insignificant.

The coefficient of LITERATE is negative and is strongly significant. Hence placement of branches appear to respond to literacy rates—with more branches being

Table 2 Placement of all NGOs: Estimated fixed-effects logit equation

Variables	Coefficients	t-Values
LANDSIZE	0.0242372	0.987
LITERATE	-0.102779	-3.631**
ELECTRICITY	0.0156035	0.842
MARKET	0.0144544	1.162
DENSITY	-0.0002954	0.593
URBAN	0.0099031	0.893
ROAD	1.373573	2.156
HOSPITAL	4.11×10^{-6}	0.294
DOCTOR	-4.30×10^{-6}	-1.241
POSTOFFICE	0.0344091	1.875*
DISTRESS	-3.255817	-2.684**

Log likelihood = -172.79

$$\chi^2_{11,391} = 39.08$$

Notes: N = 391. * = is significant at 10 percent level; ** = is significant at 5 percent level.

placed in *thanas* with lower literacy rates. Note that if considerations of demand, costs, and riskiness favor *thanas* with higher literacy rates—that is, if $(\beta_{\text{literate}} + \gamma_{\text{literate}} + \delta_{\text{literate}}) > 0$, then it may be concluded that the poverty consideration (α_{literate}) is sufficiently large enough to overturn the combined positive effect so that the net effect is negative; that is, $|\alpha_{\text{literat}}| > |\beta_{\text{literat}} + \gamma_{\text{literat}} + \delta_{\text{literat}}|$. The coefficient of the landholding variable, LANDSIZE, has a similar interpretation—that the poverty effects of the smaller land size more than outweigh the combined effects on credit demand and risk costs. LANDSIZE, however, is not significant at the 10 percent level.

The coefficient of DISTRESS is negative and significant at the five percent level. NGOs thus are less likely to place branches in high distress locations. Unlike in the case of

LITERATE above, it appears that poverty considerations (that are attendant with high-level distress) are not strong enough to compensate for the negative effects arising out of conducting business in risk-prone areas. Significantly, this result indicates the inability of even large NGOs, such as BRAC and ASA, to effectively deal with risks.

Overall, the estimated branch placement equation indicates that while NGOs appear to respond to poverty (at least to the extent that they correlate with literacy levels), they are more likely to place branches in locations that have favorable infrastructure. They also are less likely to place branches in high distress locations.

NGO-SPECIFIC EQUATIONS

The equations describing *thana*-level placement of branches of ASA, BRAC, and PROSHIKA are presented in Tables 3-5. The explanatory variables are the same as in the combined regression in Table 2, except for one extra consideration: the response of an NGO to preexisting branches of other NGOs. On the one hand, it may be the case that NGOs prefer to work in exclusive markets, in the absence of any competition or any other types of influences from other providers of similar services.³ On the other hand, it may also be the case that pre-existing branches of other NGOs in a particular location may signal to a potential entrant a community's positive social capital that contributes to social receptivity and successful operation of group-based programs. If this is the case,

³ It may even be the case that there may develop a tacit understanding among NGOs that they keep out of each others' turf.

Table 3 Placement of ASA: Estimated fixed-effects logit equation

Variables	Coefficients	t-Values
PRIORCOMP	-2.054474	-1.810*
ELECTRICITY	0.0056169	0.145
LANDSIZE	0.1028597	2.064**
LITERATE	-0.0472607	-0.839
MARKET	0.0290323	1.249
DENSITY	-0.0020257	-1.543
URBAN	-0.0476018	-0.957
ROADS	5.032872	1.894**
POSTOFFICE	0.0317485	0.979
DISTRESS	-1.613692	-0.601

Log likelihood = -45.23

$$\chi^2_{10,139} = 23.67$$

Notes: N = 139. * = Significant at 10 percent level; ** = significant at 5 percent level.

Table 4 Placement of BRAC: Estimated fixed-effects logit equation

Variables	Coefficients	t-Values
PRIORCOMP	-1.767272	-1.938**
ELECTRICITY	0.0418247	1.431
LANDSIZE	0.0713646	1.965**
LITERATE	-0.094561	-1.822
MARKET	0.009626	0.572
DENSITY	0.0001987	0.515
URBAN	0.0215618	1.394
MTROPOPT	-0.3358834	-0.252
POSTOFFICE	0.0452446	1.683*
DISTRESS	-4.187979	-2.592**

Log likelihood = -98.88

$$\chi^2_{10,252} = 29.40$$

Notes: N = 252; * = significant at 10 percent level; ** = significant at 5 percent level.

Table 5 Placement of PROSHIKA: Estimated fixed-effects logit equation

Variables	Coefficients	t-Values
ELECTRICITY	-0.023736	-0.807
LANDSIZE	-0.0141334	-0.391
LITERATE	-0.0762417	-2.205**
MARKET	0.0161901	0.950
DENSITY	-0.0000959	-0.155
URBAN	0.0116141	0.822
ROAD	0.8796203	1.096
POSTOFFICE	-0.0078585	-0.296
DISTRESS	0.5198919	0.310

Log likelihood = -93.42

$$\chi^2_{9,308} = 11.87$$

Notes: N = 308; * = significant at 10 percent level; ** = significant at 5 percent level.

clustering of NGOs may be observed. How NGOs respond to preexisting branches of other NGOs is, hence, an empirical question. For this reason, an indicator variable, PRIORCOMP, that takes the value one whenever the branch of another group-based NGO in the *thana* existed prior to the placement of a branch of the NGO in question, is used in the regression equation.⁴ For example, in the BRAC equation, the indicator variable would equal one whenever an ASA branch existed in the *thana* prior to the establishment of the BRAC branch and would equal zero otherwise. In *thanas* that do not have a BRAC branch yet, PRIORCOMP = 1 if there is already an ASA branch and zero otherwise. Hence the estimated coefficient would indicate the extent to which the existence of a similar institution operating in the area affects the decision to establish a branch. Unfortunately, at the time of writing, data on year of branch establishment were available for BRAC and ASA, but not for PROSHIKA. Therefore, the indicator variables are used only in the BRAC and ASA regressions. Also, because BRAC's group-based credit operation was established well before ASA's (Jahangir and Zeller 1995), a subset of observations that includes data only after 1987, when ASA's credit programs were fully initiated, was used in the analysis. The results of the estimated fixed-effects logit equations are discussed below.

⁴ Of course, when the NGO in question does not have a branch in the particular *thana*, PRIORCOMP equals whenever a branch of another NGO exists in this *thana* and zero otherwise.

- The coefficient of PRIORCOMP in both the ASA and the BRAC equations are negative and significant, indicating that both ASA and BRAC are less likely to establish branches in locations that already have a “competitor’s” branch.
- The coefficient of the percentage of population owning less than half an acre of land (LANDSIZE) is positive and significant at the 5 percent level in both the ASA and BRAC equations, though this is not the case with the PROSHIKA equation. On the other hand, the coefficients of literacy rate (LITERATE) are negative in all the three NGO-specific equations, though they are statistically significant only in the BRAC and PROSHIKA equations. Note also that LITERATE is the only significant variable in the PROSHIKA equation. The NGO-specific equations thus are indicative of placement decisions responding to poverty conditions, especially BRAC’s decisions, which respond to both literacy and landholding levels. Note that the landholding variable was not significant in the combined NGO regression in Table 2.
- As for the transport and communication variables, POSTOFFICE is positive and significant at the 5 percent level in the BRAC equation, while ROAD is positive and significant, also at the five percent level, in the ASA equation. This is an interesting result as BRAC aims to conduct its own banking services in the near future while ASA will continue to use banking services

offered by commercial banks. Probably for this reason, it is important for ASA to locate branches in areas that have better access to transport infrastructure, because it is this type of area where commercial banks are located.

- The coefficient for the DISTRESS variable, reflecting on covariate flood and other risks of distress in the thana, is negative, but significant only in the BRAC equation.
- None of the other variables are significant in any of the equations. It should be noted, however, that in the framework adopted here, it does not mean that the other variables are not considered at all in the placement decision. It just means that their net effect through the four factors (poverty, demand, cost, and riskiness) are not significantly different from zero.

6. ECONOMETRIC RESULTS: CLIENT COVERAGE

Having examined branch placement outcomes of the three NGOs, we now go on to examine factors that influence the client outreach of *thana*-level branches. Apart from learning what types of poverty characteristics affect client density, it is also of interest to examine whether any type of decentralization process characterizes geographical distribution of service delivery. As Ravallion and Wodon (1997) point out, in many targeted programs, it may be the case that the headquarters makes a decision about where to place a branch, but subsequently leaves it up to local managers to determine the scale of

operation of the established branch. Is this also the case of Bangladeshi NGOs? In this section, we use participation density (OUTREACH) measured as the number of participants in a specific program per 1,000 people in the *thana* as an indicator of client outreach.

The econometric specification of the outreach regression equations is similar to the branch placement in equation (6) except that the dependent variable OUTREACH is a truncated variable: client coverage is observed only in *thanas* that have branches. The procedure used to correct this sample selection bias is the two-stage Heckman procedure (1979) whereby a Mills ratio—LAMBDA—computed from the branch placement (logit) equation is used as an additional regressor in the participation density equation and appropriate adjustments are made in the computation of standard errors (Greene 1993). An additional variable YEARS is used in the outreach equation to control for the fact that client density is expected to increase with years of operation of the branch. YEARS is the number of years for which the branch has been in operation. However, because YEARS was not available for PROSHIKA, the outreach equation was estimated using data only for BRAC and ASA , with YEARS computed as the sum of years that branches of both ASA and/or BRAC in the *thana* had been in operation. The combined outreach equation estimated for ASA and BRAC is presented in Table 3.

In the outreach equation in Table 6, only the coefficients of three variables are significant: these are YEARS, LANDSIZE, and DISTRESS. These are discussed below.

Table 6 Outreach equation: BRAC and ASA

Variables	Coefficients	t-Values
YEARS	3.6693**	6.305
ELECTRICITY	0.83156×10^{-1}	0.219
LANDSIZE	-1.1799*	-1.782
LITERATE	0.22979	0.377
MARKET	-0.28682	-1.164
DENSITY	-0.77299×10^{-2}	-0.569
URBAN	-0.89751×10^{-1}	-0.283
ROAD	-0.62777**	-0.023
POSTOFFICE	-0.84270×10^{-1}	-0.213
HOSPITAL	-0.15839×10^{-3}	-0.595
DOCTOR	-0.33360×10^{-4}	-0.462
DISTRESS	53.777**	4.175
LAMBDA	-5.4164	-0.629

Log likelihood = -572.11

$F_{12,108} = 4.62$

Notes: N = 121; * = significant at 10 percent level; ** = significant at 5 percent level.

- The coefficient of YEARS is positive and highly significant, indicating that NGO institutions have expanded their client base through time. Indeed if it was the case that YEARS was the only variable significant in the equation, this would have suggested that once a branch was placed in a particular location, client coverage was mostly determined without significant reference to local specificities. However, this is not the case since at least two other area characteristics appear to influence outreach.
- Outreach is significantly higher in *thanas* that have a higher DISTRESS index. This result is completely opposite to that of the placement equation that had indicated that placement rule disfavored high distress areas. The result thus suggests that though branches are less likely to be placed in high

distress areas, once established, they have higher client densities. This is a plausible scenario. First, it may be that demand for special financial services like that provided by the NGO institutions is especially large in these backward, high-risk *thanas*, especially since these areas are inadequately served by other market-based or government-sponsored organizations. Second, it may indeed be part of institutional policy to have higher levels of outreach in relatively more depressed areas. Third, as suggested above, it may also be reflective of partial decentralization in service delivery whereby local branch managers, once the branch is set up, exercise more control in outreach-related decision functions that are more responsive to local conditions. Indeed, it may well be possible that high outreach requirements of branches placed in distressed areas may, in fact, put pressure on NGOs to limit the number of branches operating in such areas.

- Outreach is significantly lower in *thanas* that have a higher proportion of marginal farmers, as shown by the negative coefficient of LANDSIZE. But it remains unclear whether this result is driven by supply or demand factors. In Section 2, it was noted that a significant proportion of the projects financed by NGOs were off-farm microenterprises engaging in rural trading, food processing, and handicraft production. If, indeed, financing off-farm microenterprises (rather than agricultural production) is one of the main objectives of the NGO institutions, then outreach would be responsive not

just to the proportion of the population owning less than 0.5 acres of land, but also to the presence of landless wage laborers who are likely to be even poorer.

- Though it was clear from the placement equations that branches were more likely to be established in *thanas* with better communication and transportation infrastructure, there is no evidence that, once a branch is established, client outreach also responds to infrastructure-related characteristics. This once again suggests discontinuities between the placement and outreach decision functions.

The NGO-specific equations in Tables 7-9 largely echo the findings of the combined equation in Table 6 and are therefore not discussed separately.

7. CONCLUSIONS AND POLICY RECOMMENDATIONS

Our analysis indicates that even though the placement of branches of NGO institutions were attentive to poverty considerations, branches were more likely to be established in locations that had better access to transport and communication infrastructure. Hence it appears that NGO services are geared more toward the poor who reside in relatively well-developed areas rather than toward the poor in more remote and less developed regions. Client density of the existing branches, however, did not exhibit

Table 7 Outreach equation: ASA

Variables	Coefficients	t-Values
YEARS	1.8775**	2.360
ELECTRICITY	-0.26966	-0.782
LANDSIZE	-0.64975*	-1.803
LITERATE	0.14303	0.727
MARKET	-0.25883**	-2.018
DENSITY	0.64746x10 ⁻²	1.137
URBAN	-0.16404	-0.786
ROAD	22.129	1.164
POSTOFFICE	-0.13857	-0.591
HOSPITAL	0.20427x10 ⁻³	1.229
DOCTOR	0.58186x10 ⁻⁴	0.896
DISTRESS	29.506**	3.129
LAMBDA	-6.2603	-1.365
Log likelihood = -88.64		
F _{12,17} = 1.92		

Notes: N = 30; * = significant at 10 percent level; ** = significant at 5 percent level.

Table 8 Outreach equation: BRAC

Variables	Coefficients	t-Values
YEARS	11.729**	4.355
ELECTRICITY	0.24252	0.419
LANDSIZE	-1.3952	-1.252
LITERATE	0.75704	0.630
MARKET	-0.23829	-0.608
DENSITY	-0.25463x10 ⁻²	-0.098
URBAN	-0.38024	-0.752
ROAD	-46.715	-1.053
POSTOFFICE	-0.20706	-0.373
HOSPITAL	-0.24825x10 ⁻³	-0.689
DOCTOR	-0.14880x10 ⁻⁴	-0.110
DISTRESS	27.334	1.366
LAMBDA	0.39479	0.039
Log likelihood = -328.69		
F _{12,56} = 1.85		

Notes: N = 69; * = significant at 10 percent level; ** = significant at 5 percent level.

Table 9 Outreach equation: PROSHIKA

Variables	Coefficients	t-Values
ELECTRICITY	0.25219	0.343
LANDSIZE	-1.2036	-1.474
LITERATE	-0.15589	-0.256
MARKET	-0.67597*	-1.844
DENSITY	0.18198x10 ⁻¹	1.130
URBAN	1.0296**	2.511
ROAD	54.068	1.510
POSTOFFICE	-0.65262	-1.059
HOSPITAL	0.37920x10 ⁻³	1.258
DOCTOR	-0.13099x10 ⁻³	-1.479
DISTRESS	91.139**	5.294
LAMBDA	-16.524*	-1.846
Log likelihood = -197.0947		
F _{11,33} = 2.04		

Notes: N = 50; * = significant at 10 percent level; ** = significant at 5 percent level.

such a feature and actually tended to be better in less favorable and more "distressed" locations.

Greater concentration of branches in the better areas may, in part, be the result of a search for locations where the marginal impact of credit services is the greatest. Typically, accompanying constraints on production or income—e.g., those imposed by the lack of markets, transportation, and/or communication—are likely to be less severe in areas that have good infrastructure. For example, loans for financing the production of highly market-dependent outputs—such as production of commercial crops, and other nonfarm micro enterprises—are less suitable for remote areas. Moreover, banking services become especially risky in remote areas where co-variance in household incomes are likely to be very high. In such areas, high repayment rates that are necessary to maintain NGOs' access to subsidized funds from various agencies are harder to achieve. Furthermore, the unavailability of commercial banks limits financial operations in remote or poor locations. Hence, as suggested in the previous section, NGOs may follow a strategy of placing fewer branches in distressed areas, but with each of these branches serving a larger number of clients. The tension between poverty targeting and ensuring adequate financial performance is thus quite clear in the way the NGOs place their services geographically.

If simultaneous efforts to reach the poor, to maximize marginal impact of services, and to keep loan delinquency at the minimum introduces considerable tension in service placement decisions of NGOs, solutions for reducing this tension lie in innovative lending technologies that reduce transactions costs for both lenders and borrowers and increase

marginal returns of loans for the poor in disadvantaged locations. We suggest four strategies towards this end: (1) area-specific innovations and differentiations in financial products; (2) performance and location incentives for branch staff; (3) reduction in dependence on branch offices of commercial banks; and (4) increased donor support for expansion of programs in the remote and vulnerable areas.

1. *Area-specific innovations and differentiations in financial products.* The demand for different types of loan and savings services is affected by a range of area-specific factors. Reducing the cost of credit delivery and increasing the marginal impact of credit on borrowers depend on the extent to which credit and savings services are responsive to area-specific characteristics. However, it is presently the case that financial products of nongovernmental organizations are usually standardized for the entire country. While the branch managers have sufficient decision flexibility in managing the headquarters-prescribed array of financial products, they do not have the flexibility to design new financial products or introduce modifications to existing ones. Presumably, headquarters offices do not possess the full information necessary to evaluate the potentials and constraints of service branches. Hence, it is suggested that lower-tier institutions, such as divisional or district offices, be given some flexibility and incentives to modify existing financial and other services or to introduce new services on a pilot level. Such area-specific modification and

innovation may well cover the terms of the credit contract, including spatial differentiation of interest rates.

2. *Performance and location incentives for branch staff.* To improve outreach and cost recovery in bank branches, managers and their staff could receive special incentives for above-average performance. Successful innovations by branch or district managers, as mentioned above, could be especially rewarded. Furthermore, if the presumed self-selection of good managers to urban areas is valid, some form of compensatory payments could be given to managing staff or branch offices that operate in remote areas where access to basic social services and economic infrastructure is lacking.
3. *Reduction in dependence on branch offices of commercial banks.* NGO branches currently depend on a commercial bank office at which funds are deposited and withdrawn. This has the effect of limiting the outreach of the NGOs only to those areas where such bank branches exist. The Grameen Bank, one of the pioneers in microcredit, has chosen to maintain its own network of branch offices that perform all functions of money transfer between branches and regional offices and headquarters. When other NGO-supported financial systems reach a critical size, they may well follow this example; BRAC, for example, actually plans to develop a rural bank branch network of its own. However, for the smaller NGOs, this would not be economical. A solution here may lie in the establishment of subdistrict NGO units in remote areas that act as “NGO bank branches” by mediating between

individual branch offices and commercial bank branches. The establishment of such units may well be supported by a consortium of NGOs targeting a particularly vulnerable area so that the unit services a number of NGOs at the same time. Yet another possibility is that of mobile banking where remote branch offices are served by regional or district NGO or commercial bank offices on a prescribed time schedule. Insofar as above-average-skill managers exhibit a preference for locating themselves near towns, the system of mobile banking allows remote branches to be continued to be served by a cadre of qualified managers instead of being "trainee branches." For the borrower or saver, it provides access where this was not possible before.

4. *Increased government and donor support for expansion of programs in particularly remote and vulnerable areas.* The placement of a branch office, the recruitment and training of its personnel, and the formation and training of groups require considerable up-front investments, especially in remoter areas. However, it is also likely that many remote *thanas* in Bangladesh that are currently not served have sufficient long-term demand that is able to support total cost of operation. Hence, donor and government support to target selected remote areas, and accelerate expansion of the branch network in these areas can, in many cases, be justified, both from the efficiency and equity perspectives.

REFERENCES

- ASA (Association for Social Advancement). 1994. *Annual report*. Dhaka, Bangladesh.
- ASA (Association for Social Advancement). 1996a. *Impact of income generation through credit program (IGP) on family income and expenditure*. Dhaka, Bangladesh.
- ASA (Association for Social Advancement). 1996b. *ASA in Micro-Finance 1996. Annual report 1996*. Dhaka, Bangladesh.
- Bangladesh Bureau of Statistics. 1991-1994. *Statistical yearbook*. Dhaka: Ministry of Planning.
- Binswanger, H., S. R. Khandker, and M. Rosenzweig. 1993. How infrastructure and financial institutions affect agricultural output and investment in India. *Journal of Development Economics* 41: 337-366.
- BRAC (Bangladesh Rural Advancement Committee). 1989-1994. *Statistical Report, RDP and RCP*. Dhaka, Bangladesh.
- Chowdhury, A. M. R., M. Mahmood, and F. H. Abed. 1991. Credit for the rural poor in Bangladesh. *Small Enterprise Development* 2 (3): 4-11.
- Credit and Development Forum. 1996. *Savings and credit information of NGOs (Data of March and June 1996)*, Vol. 2, No. 1. Dhaka, Bangladesh.
- Grameen Bank. 1994. *Annual report*. Dhaka, Bangladesh.
- Greene, W. H. 1993. *Economic analysis*. Englewood Cliffs, N.J., U.S.A.: Prentice Hall Inc.

- Heckman, J. J. 1979. Sample selection bias as a specification error. *Econometrica* 47 (1): 153–161.
- Heckman, J. 1990. Varieties of selection bias. *American Economic Review* 80 (2): 313–318.
- Helen Keller International. 1994. *NSP thanas*. Dhaka: Helen Keller Institute of Public Health and Nutrition.
- Hossain, M. 1988. *Credit for alleviation of rural poverty: The Grameen Bank in Bangladesh*. Research Report 65. Washington, D.C.: International Food Policy Research Institute.
- Jahangir, A. S. M., and M. Zeller. 1995. Rural finance programs for the poor in Bangladesh—A review of five major programs. International Food Policy Research Institute, Washington, D.C.
- Khandker, S., B. Khalily, and Z. Khan. 1995. *Grameen Bank: Performance and sustainability*. Discussion Paper 306. Washington, D.C.: World Bank.
- Lovell, Catherine H. 1992. *Breaking the cycle of poverty: The BRAC Strategy*. West Hartford, Conn., U.S.A.: Kumarian Press, Inc.
- Pitt, M., M. Rosenzweig, and D. Gibbons. 1995. The determinants and consequences of the placement of government programs in Indonesia. In *Public spending and the poor*, ed. D. Van De Walle and K. Nead. Baltimore, Md., U.S.A.: Johns Hopkins University Press for the World Bank.

- Ravallion, M., and Q. Wodon. 1997. Evaluating a targeted social program when placement is decentralized. World Bank, Washington, D.C.
- Sharma, M., and M. Zeller. 1997. Repayment performance in group-based credit programs in Bangladesh: An empirical analysis. *World Development* 25 (10): 1731-1742.
- Zeller, M., M. Sharma, and A. Ahmed. 1996. Credit for the rural poor: Country case Bangladesh. Final Report submitted to German Agency for Technical Cooperation (GTZ). International Food Policy Research Institute, Washington, D.C.