ASSESSING IMPACT OF CONVENNING AND CONVINCING PROGRAM IN BANGLADESH:

PSM APPROACH

Matiur Rahman Ph.D.

Professor (Adjunct), North South University, Bangladesh

**Abstract**

A statistical analysis for the performance of the nationally very important project titled “**Convening and Convincing Program** “ has been performed in this paper. Principally we have adopted **Propensity Score Matching (PSM) t**ool for crucial performance indicators. Interesting intermediate results have been achieved within a short span of time. Such outcomes are, some improvement in Awareness about nutritional services, credit facilities, upgraded claim rights, knowledge about nutritional issues and practices, participation of women in income generation activities and decision making, upgraded Value Chain. Another remarkable improvement is noticed in the dimension of Gender equity and youth participation in decision making and income generation activities. Access to financial loaning sources have been enhanced. Increased income, improved quality, diversification in income earning, increased demand etc. are the intended objectives and have been achieved to an acceptable extent during the project period.

**Key words: Convening and Convincing, Multivariate Statistical Analysis, Pathways, Propensity Score Matching, Maximum Likelihood, Women empowerment.**

**1. Background of the program**

ICCO Cooperation, an International Development Organization, with its roots in the Netherlands, leads development efforts across 44 countries in Asia, Africa and Latin America. Throughout our 50 years of history, ICCO has had remarkable experiences in working together with local partners for community ICCO Cooperation in Bangladesh welfare and development. Solutions center around our twin core principle of sustainable livelihoods and dignity and justice and our programs and aim at eradicating extreme poverty from the remote grassroots through our integrated programs of food and nutrition security, conflict transformation and democratization, fair economic development, and WASH. We collaborate with multi-stakeholders like private sector, government, partner organizations, knowledge institutes and community based organizations to bring lasting positive changes in the lives of the communities we work with. A central objective of Convening and Convincing is to counter the limited, and decreasing, political space for CSOs around the world. Strengthening the lobbying and advocacy (L&A) capacity of CSOs is central to Theory of Change (ToC) in strategic partnership application. The themes addressed in the ToC are closely related to the Multi Annual Strategic Plan (MASP) of ICCO Cooperation, which builds on two main pillars: ‘Justice and Dignity for All’ and ‘Sustainable Livelihoods.’ The L&A programs that we will develop under the strategic partnership will be integrated within broader programs implemented by members of the Consortium and with multiple funding sources. This means that L&A interventions will not be implemented as standalone activities but will complement existing program activities thus mutually reinforcing one another. ICCO Cooperation Bangladesh focus its activities in Rangpur, Khulna and Barisal division.

The overall goal of this strategic partnership is to ensure that CSOs and civil society at large in Bangladesh as well as the global context, can contribute to decreasing inequality and injustice in societies in order to create the conditions for just economic, social and political development. To this end, Theory of Change in our Convening and Convincing application, three pathways of change that we believe will enable us to achieve our overall goal.

Three pathways

a. Pathway 1: Political space for CSOs

Pathway 1 is meant for supporting and strengthening civil-society organization to be vibrant and critical and that by lobbying and advocacy claim their rights and set their own priorities in a changing and challenging environment. This pathway will work on land rights and informal agro sector labours issues. The key problem identified for pathway 1 is that Informal agro labours have no scope for equal wage, occupational safety and access to Khas land due to not addressing them in the national labour law and improper implementation of land use policy. The space for CSOs to effective lobby for formulation of policy for informal agri sector and access to land needs to improve in order to create more structural access to land for landless/land poor. To address the issues, ICCO will support the existing platforms of citizen groups through partners to become more effective in creating spaces to raise their voice. The key interventions are capacity development of CSOs, creating awareness and mobilizing people from local to national level on labour and land rights issues, involving media, establishing or linking networks and action research. The stakeholders are partner NGOs, CSOs labour association, landless farmers, ministry of land, ministry of labour & employment and its respective department. It is expected that, politicalspace for CSOs will be created to deal with the rights of agro labours and rights to access to Khas land. As a result, it will ensure the rights of the informal agro labour to get access to their land through enhancing capacity of their grassroots organizations, connecting them with the national networks of CSOs and facilitating them to raise their voice in different platforms.

Some important lobby issues are:

Lobby issue 1: Does the existing labour law and include informal agriculture sector’s labour in the legal framework well enough?

Lobby issue 2: Does the khasland management and distribution committee at national and local level functional?

Lobby issue 3: Is the Land use policy effectively implemented?

Lobby issue 4: Can we Influence the private sector to not grab the khasland?

b. Pathway 2: Realizing the right to adequate food and nutrition

Pathway 2 aims at achieving a significant reduction in the incidence of stunting among young children in the north and south regions of Bangladesh in Rangpur, Khulna and Barisal divisions. The key problem is poor access to nutrition services for under aged 5 children and women. Government has national nutrition policy (NNP) and nutrition plan of action for nutrition (NPAN) but assumed that local and national level CSOs are not fully aware on these policy and action. To address the problem and achieve the goal, set of integrated nutrition specific and nutrition sensitive interventions including lobbying and advocating in partnership with Government, CSOs& private sector to improve food and nutrition security of very poor households. ICCO Consortium and partner jointly will implement the pathway 2. It is expected at end that improved nutrition of under 5 children and women (100days). The stakeholders are partner NGO, ministry of health & family welfare, ministry of child

and women’s welfare, ministry of agriculture, ministry of fisheries & livestock.

Some important lobby issues are:

Lobby issue 1: Is the quality nutrition specific & sensitive services provided or available for under 5 children and

women (lactating and pregnant)?

Lobby issue 2: Does the action plan ensure integration between health and agriculture line department?

c. Pathway 3: Small-producer empowerment and inclusive markets

The goal of Pathway 3 is to contribute to an enabling service and governance environment at local, regional and international levels, resulting in the increased inclusion of marginalized group (small-scale producers including women, youth and workers) and their organizations in value chains, which contributes to improved incomes and livelihoods of these groups and sustainable value chain development. The key problem is small producers are unable to acquire access to the opportunities, skills and resources to upgrade and do not have the capabilities to engage with and influence the market system to reap the benefits that arise from upgrading processes. To address the problem, intervention like lobby-advocacy, capacity building, research and knowledge will be taken. Finally it is expected that empowered producers have higher economic status through increased income as result

of improved access to services, finance and market. The stakeholders are partner NGO, service providers association, private service providers, extension agent, producers group, federal producer group, private company, department of cooperative etc. The geographical focus of pathway 3 is in North of Bangladesh.

Some important lobby issues under the pathway 3:

Lobby issue 1: Does government provide any specific support to smallholder farmers to strengthen their bargaining position in dealing with agribusiness and other corporate, for example through public extension services that include modules on contracts and rights, or facilitating the development of and access to private sector providers of similar services?

Lobby issue 2: Does the legal framework recognize and protect organized farmer groups that are not legal cooperatives? Does the policy framework promote farmer groups other than formal cooperatives?

Lobby Issue 3: Is there a legal requirement to consult with smallholder farmers on policies that will affect them?

Are special measures in place to ensure women are adequately represented in consultations?

The three pathways need to be viewed as interconnected channel to achieve the overall goal of securing sustainable livelihoods for small-scale producers and workers and their families. Ensuring access to natural and productive resources are crucial elements in achieving our overall goal of contributing to sustainable livelihoods. The interconnections among the pathways are particularly true in the case of Pathway 1 on political space, which is a goal in itself while, at the same time, it crosscuts the two ot her pathways. Capacity development for L&A is central in the first pathway of change and underlies and crosscuts all other pathways. The focus is on empowering CSOs to undertake L&A to defend the interests of the beneficiary groups they represent, from the community or beneficiary level to the national/global level through the work of CSO alliances. Capacity development is also integrated in the other pathways, focusing on the specific thematic and organizational capacities required to undertake effective L&A under each pathway of change. L&A strategy including independent & deeply rooted in the right-based approach, partner-biased, part of a programmatic approach of ICCO’s multiannual strategic plan and evidence based.

2**. Rationale of the study**

Both quantitative and qualitative informationhave been collected and analysed so that critical analytical understanding on current status as per pathways design can be well understood and the program can be befittingly launched.

3. **Conceptual Frame work**

**Propensity Score Matching (PSM)**

The concept of PSM was first introduced by Rosenbaum and Rubin (1983). They have defined propensity score ei for subject i ,(i = 1,2, ……N) as the conditional probability of being assigned to a particular treatment given a vector of observed covariates xi. In randomised studies , covariates are variables that are not affected by allocation of treatments to subjects. We have,

ei = Pr (yi = 1││xi) where yi = 1 for treatment and yi = 0 for control.

Heckman (1987) also played role in the development of PSM. He focussed on selection bias, with primary emphasis on making causal inferences when there is non-random assignment. He later developed the difference in differences approach which has application to PSM.

The PSM technique has been applied in a wide variety of fields in the program evaluation literature. For example, Heckman, Ichimura and Todd (1998), Lechner (1999), Dehejia and Wahba (2002), and Smith & Todd (2005) use PSM techniques to estimate the impact of labor market and training programs on income; Jalan and Ravallion (2003) evaluate antipoverty workfare programs; Faliani, Gerter and Schargrodsky (2005) study the effect of water supply on child mortality; Trujillo, Portillo and Vernon (2005) analyze the impact of health insurance on medical-care participation; Almus and Czarnitzki (2003) and Moser (2005) evaluate impact of R & D subsides & patent laws on innovations.

The greatest challenge in evaluating any intervention or program is obtaining a credible estimate of the counterfactual: What would have happened to participating units if they had not participated? One feasible solution to this problem is to estimate the counterfactual outcome based on a group and of nonparticipants. Then calculate the impact of the intervention as the difference in mean outcomes between groups and the comparison group must be statistically equivalent to the initial treated group. In other words, the groups that must be identical except for the fact that one of them received the treatment and the other not. Thus, the main concern is how to find a proper comparison group.

Suppose, the impact of a treatment for an individual i, noted  is defined as the difference between the potential outcome in case of treatment (Y1i) and the potential outcome in absence of treatment (Yoi).



An evaluation seeks to estimate the mean impact of the program, obtained by averaging the impact across all the individuals in the population. This parameter is known as **Average Treatment Effect or ATE:** =E(= E(Y

where E(.) represents the average (or expected value).

Average Treatment Effect on the Treated, or ATT, which measures the impact of the program on those individuals who participated is also of interest.

ATT = E(Y

Finally, the Average Treatment Effect on the Untreated (ATU) measures the impact that the program would have had on those who did not participate:

**ATU = E(Y**

Problem is that all of these parameters are not observable, since they depend on counterfactual outcomes. For instance, using the fact that the average of a difference is the difference of the averages, the ATT can be rewritten as:

ATT = E(Y

E( is the average outcome that the treated individuals would have in the absence of treatment. However, we do observe the term E(, the value of Yo for the untreated individuals. Thus, we can calculate:

= E(Y

What is the difference between  and the ATT? Adding and subtracting the term E(Y:

= E(Y+-

=ATT +-

=ATT+SB

SB is the selection bias: the difference between the counterfactual for treated individuals and the observed outcome for the untreated individuals, If this term is equal to 0, then the ATT can be estimated by the difference between the mean observed outcomes for treated and untreated:

ATT= -

In many cases the selection bias term is not equal to 0. In these cases, the difference in means, will be a biased estimator of the ATT. The main goal of an evaluation is to ensure that the selection bias is equal to 0 in order to correctly estimate the parameter of interest.

We use Y1 and Yo to denote the potential outcomes in presence and absence of the treatment, respectively. The observed outcome Y for an individual will be Y1 if the individual is treated and Yo otherwise, We use the binary variable D to indicate the treatment status of the observed units. D=1 for those who participate and D=0 for those who do not participate. Then the observed outcome is:

Y0+DY1. When a given unit is treated, then D=1, and thus (1-D)=0. The observed outcome for this unit will be: Y1=Y1

which means that the observed outcome (Y) for treated units is equal to the potential outcome in case of treatment (Y1). In this case, the potential outcome in absence of treatment, Yo, is not observed: since the unit was treated, it is impossible to know what would have happened to this unit in absence of treatment. For a treated unit Yo is the counterfactual. Similarly, when the unit is not treated, D=0 and (1-D) =1, and thus Y=Yo. In this case, the counterfactual is Y1.

Random assignment methods assure that the treatment is independent of Yo and Y1 and the factors influencing them. The average treatment effect for those subject to random assignment may be estimated as the simple difference in mean outcomes for those assigned to treatment and those assigned to the control group. In nonrandom assignment, treatment may be correlated with factors influencing Yo and Y1, participants may differ from nonparticipants in many ways. So the simple difference in outcomes between participants and nonparticipants will not necessarily identify the impact of the intervention. Matching methods ensure that impact estimates are based on outcome differences between comparable individuals. Such approach has been adopted in the present case. PSM uses information from a pool of units that do not participate in the intervention to identify what would have happened to participating units in the absence of the intervention. By comparing how outcomes differ for participants relative to observationally similar non participants, it is possible to estimate the effects of the intervention. Propensity-score matching, one of the most important innovations in developing workable matching methods, allows this matching problem to be reduced to a single dimension. The propensity score is defined as the probability that a unit in the combined sample of treated and untreated units receives the treatment, given a set of observed variables. If all information relevant to participation and outcomes is observable to the researcher, the propensity score (or probability of participation) will produce valid matches for estimating the impact of an intervention. Therefore, rather than attempting to match on all values of the variables, cases can be compared on the basis of propensity scores alone.

**Sampling Strategy**

**Sample size of Households/Respondents (Treatment group)**

We have determined a representative sample size of respondents and for such purpose we have used the following statistical formula.

n = n0/ 1+ ( n0 -1)/N where, n0 = First approximation = z 2 p q/ e2, n = Sample size .

p = Estimated proportion of households having sought nutritional services at least once in last six months.q = 1-p, Z = Standard normal variate value at 95% confidence level , e= Precision level (5%)

N= Total Number of households . We have used 50% design effect cum non-response rate.

**Total estimated sample size of respondents = 3,910**

**Sample size of Households/Respondents (Control group)**

Sample size for control group is also the same i.e., 3910

**Thus, total sample size for the study is = 7,820.**

**4. Data Description**

The study was conducted all over Bangladesh. For the sample of 3910 respondents a three-stage stratified random sampling strategy was adopted. After proportional to 7 Divisions, Upazilla (an administrative unit) was considered as Primary Sampling units (PSUs). From every Division, 5% upazillas were selected using PPS and within each selected upazilla, 10% Unions were selected at the second stage and within selected Union, allotted number of households were selected using SRS. It may be noted that, from every selected household, household head was brought under the study as study agent/respondent. Control group respondents were selected from Upaazillas other than those for treatment group.

**5. Study Results and Analysis**

In this section we present our study findings in association with brief analysis.

Propensity score has been obtained using Binary probit on project involvement on covariates like age of respondent, years of schooling, income, family size, land size, awareness about nutrition services, claim rights, purchase decision etc).

**Estimation Method**

Maximum Likelihood (ML) techniques has been adopted to estimate the parameters in the PSM frame work.

**Table1: Probit Estimation results**

**Log likelihood= -1746.45**

**Variable Z P(Z>|Z|)β**

Years of schooling 3.98 .00 .43

Age of respondent 4.15 .00 .54

Education of respondent 3.87 .00 .74

Log (per capita Expenditure) 4 .00 .13

Log (land size)6 .00 .08

Non-farm income 8 .00 .10

Household size4.8 .00 .09

Claim rights 3.12 .00 .37

Awareness of nutrition services 2.12 .005 .47

Participation of women in

**purchase decision 4.12 .00 .67**

**Participation of women in Income**

**generation activities3.24.00 .35**

**Participation of women in**

**marriage decision3.32 .00 .47**

It is very much clear from Table1 above that propensity to ICCO involvement is very sensitive to income, size of households, land size, education status, Claim rights , Participation of women inpurchase decision, Participation of women in Income generation activities etc.

**Table 2. Impact of project activities**

**Per capita**

**Income ICCO Project**

**OLS PSM**

**Estimate (s.e.) Estimate (s.e.)**

**Ave effect by deciles 2.6 0.1 2.4 0.2**

1 2.2 0.2 2.3 0.4

2 2.0 0.3 2.1 0.5

3 2.2 0.3 2.3 0.3

4 2.4 0.2 2.4 0.2

5 2.5 0.2 2.6 0.1

6 2.4 0.2 2.5 0.2

7 2.6 0.2 3.2 0.2

8 2.5 0.2 -3.2 0.2

9 3.1 0.2 -3.6 0.6

10 2.6 0.2 3.2 0.2

**Table 3. Sample Means of different variables**

**Variable Treatment group Control group**

**Years of schooling 10.36 10.08**

**Age 46 49**

**Family size 4.42 5.38**

**Land holding (acres) 5.6 5.7**

**Weekly working hours before intervention 47 48**

**Weekly working hours after intervention 57 49**

**Income ( monthly) before intervention 3689 3525**

**Income ( monthly) after intervention 4786 3498**

**Involvement in IGA before intervention .6986 .787**

**Involvement in IGA after intervention .878.707**

**Claim rights before intervention 3.12 .37**

**Claim rights after intervention 4.12 .47**

**Awareness of nutrition services**

**before intervention 2.12 .47**

**Awareness of nutrition services**

**before intervention 3.32 .37**

**Awareness of nutrition policies**

**before intervention 3.22 .37**

**Awareness of nutrition policies**

**After intervention 4.32 .77**

**Increased nutrition services**

**before intervention 3.32 .57**

**Increased nutrition services**

**after intervention 5.32 .59**

**Increased credit facilities**

**before intervention 3.42 .37**

**Increased credit facilities**

**after intervention 5.55.66**

**Women getting loans**

**before intervention 3.62 .67**

**Women getting loans**

**after intervention 4.77 .87**

**Participation of women in**

**agricultural activities**

**before intervention 3.12 .37**

**Participation of women in**

**agricultural activities**

**after intervention 4.43 .87**

**Participation of women in**

**sales decision before intervention2.92 .47**

**Participation of women in**

**sales decision after intervention 3.08 .777**

**Participation of women in**

**purchase decision before intervention 4.12 .67**

**Participation of women in**

**purchase decision after intervention 5.07 .89**

**Participation of women in Income**

**generation activities before intervention3.24 .35**

**Participation of women in Income**

**generation activities after intervention 4.14 .66**

**Participation of women in**

**health decision before intervention 4.52 .57**

**Participation of women in**

**health decision after intervention 5.11 .68**

**Participation of women in**

**marriage decision before intervention 3.32 .47**

**Participation of women in**

**marriage decision after intervention 4.77 .57**

We notice in the above table that the two groups do not significantly differ in terms of covariates before intervention. But, after intervention, respondents in two groups namely, treatment and control group, differ significantly in terms of most of the covariates. Such results have been obtained after matching the respondents in the combined group with similar propensity scores.

**5. Conclusion**

This paper presents propensity score-matching method that is able to yield accurate estimates of the treatment effect in non-experimental settings in which the treated group differs substantially from the potential comparison units. The method is able to make the large comparison group down to the relevant comparisons without using information on outcomes Thus, it allows outcome data to be collected only for the relevant subset of comparison units. We can draw conclusion that it is extremely valuable to check the comparability of the treatment and comparison units in terms of pretreatment characteristics, which the researcher can check in most applications. The propensity score method dramatically highlights the fact that most of the comparison units are very different from the treated units.

Policy Implications. Followings are the messages as emerged from the study findings. These can be taken into account by policy makers. 1.Widespread use of project initiatives can result in substantial reduction in loss of working hours. 2.In order to increase access to project activities, knowledge power of users needs to be enhanced through promotion campaign. Affordability of citizens is a concern. 3.More clarity is needed in the distribution system of project materials and messages. Pro-poor venture needs to be ascertained. 4.Upfront costs burden can be lessened through proper and active participation of local level people in the form of voluntary organizations. 5.Motivational activities need to be strengthened so that knowledge and awareness of citizens are widened so that they can reap massive benefits out of the project. Crosscutting issues like improved nutritional practices, gender equity and youth participation will also enhance. This will bring broad-based economic growth ensuring long-term livelihood security through adopting ICC initiatives.

**References:**

Becker, S. & A. Ichino, 2002 Estimation of Average Treatment Effects Based on Propensity Score, The Stata Jounal 2(4) .

Imbens, G. & J. Wooldridge 2009. Recent developments in the Econometrics of Impact