



Farmer Cluster Groups, Child Nutrition and Health¹

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Outline

- **Introduction & RRL**
 - Farming clusters in the Philippines
 - Effect of Farming clusters on income
 - Potential Effects of farming cluster on child health and nutrition
- **Objective**
 - Do improvements in household income as a result of membership in farming clusters translate to better nutrition and food intakes especially for children.
- **Methods**
 - Matching Methods
 - Propensity score matching (PSM) methods
- **Expected Outcomes**
- **Limitations**

Introduction

- The emergence of cooperative strategies such as farmer cluster groups were designed to enable small farmers have access to value driven or institutional markets by engaging in activities that comply with the rigorous requirements in **volume** and **product quality** (Montiflor, Bhatt and Murray-Prior 2008; Batt et al. 2011)
- Cluster farm members organize themselves in order to increase volume capacity by pooling resources and minimize transport and transactions costs by delivering in bulk (Montiflor, Batt and Murray-Prior 2008).
- Thus, members become equipped with strategic market knowledge that enables them to negotiate a higher price thereby increasing household income (Axalan et al. 2011).

Related Literature

- Recent literature has focused on the effect on household income, membership in community groups can also affect vulnerable groups such as children in the household:
 - A study done by DeLoach and Lamanna (2011) found that the presence of community microfinance institutions resulted in significant and positive effects on child nutrition.
 - Likewise, Pongou, Ezzati and Salomon (2006) found that improvements in weight-for-age and height-for-age z scores of Cameroon children were statistically linked to increasing household socio-economic status.

Research Objectives

- To compare the household income of farmers who are program participants of cluster groups and those who are not members, and
- To evaluate changes in children's BMI, nutrition and food intakes between households that are participants of cluster groups and households that are not participants

Research Strategies

- Step 1. Interface with international collaborators with regards to the research design and collection of data
 - To further, strengthen the study, UP Mindanao researchers will work closely with international collaborators especially in the refinement of the research design and data collection. This is to ensure that the appropriate control groups are identified and the variables that are likely to affect cluster membership are collected

Research Strategies

- Step 2. Identification of Program participants and non-participants.
 - Proposed site is Brgy. Marilog, Davao city
 - Target farms that produce sweet pepper and tomato
 - Member(Pamuhatan farmers association) and non-member of cluster: same socio- demographic & economic characteristics (non-member in a different sitio within Brgy. Marilog)
 - The control samples must be 3-4x relative to treatment samples
 - Child BMI information child (height, weight and age will be procured from Brgy. Schools and Health Workers)
 - *Occurrence of diseases and information pertaining to vaccination (inclusion of health baseline data)*
 - *4P: they have record of school attendance for the child*

Research Strategies

- Step 3. Assemble data on member households of farmer cluster groups and non-members.
 - household socio-demographic and economic information,
 - data on outcome variables namely household income,
 - children's BMI
 - nutrient intakes in carbohydrates, protein, fat, and cholesterol will be collected
 - Also children's food serving intakes in vegetables, fruits, grains, pork, beef, chicken, fish, eggs, sugar, and milk

Research Strategies

- Step 4. Utilize the propensity score method (PSM) in comparing the control group (non-member households) with the treated group (member households).
 - The derivation of propensity scores follows the standard practice of estimating a binary probit model.

$$\Pr(T = 1|X) = \Phi(\mathbf{X}'\beta),$$

- *where* Φ is the standard normal distribution function and \mathbf{T} is the treatment variable. \mathbf{X} is a vector of explanatory variables that are likely to be associated with the probability of participating in the farm cluster program.
- The proposed explanatory drivers include household head demographics (gender and age), education of the household head, training, membership in a cooperative, amount credit utilized, household size, farm conservation practices, total farm area, area devoted to sweet pepper and tomato production, area devoted to corn and rice production and net profit levels of rice & corn.

Research Strategies

- Step 5. Utilize methods to match program participants and non-program participants)
 - Nearest neighbor matching
 - The nearest neighbor method matches each treatment unit and the control unit with the nearest propensity score. However, usage of the nearest neighbor techniques can still yield instances where the distance between propensity scores of the treated unit to its nearest control unit is still high.

Research Strategies

- Step 5. Utilize methods to match program participants and non-program participants)
 - Radius/caliper matching
 - However, usage of the nearest neighbor techniques can still yield instances where the distance between propensity scores of the treated unit to its nearest control unit is still high. Thus, the caliper or radius matching approach addresses this issue by making use of a caliper or threshold value that restricts propensity scores at a certain range.

Research Strategies

- Step 5. Utilize methods to match program participants and non-program participants)
 - Kernel based matching methods
 - On the other hand, the use of parametric matching estimators can yield few control units that can match the treatment groups. Thus in order to address this shortcoming, non-parametric methods such as kernel matching approach constructs a statistical counterfactual match for each treatment unit by calculating the weighted average of the control groups' propensity scores.

Expected Outcomes

- A key outcome includes an understanding on whether **farmer cooperative strategies** such as farm cluster groups **affect child health and nutrition**.
- In the longer term, the **results of the study** can be used for input for other potential projects, design of **policy instruments** and guidance on decision making in improving **children's health and nutrition**.

Limitations

- The PSM approach hinges on the assumption that observed characteristics drive program participation. However if there are important unobservables that are driving both group participation and health outcomes, then the resulting sample selection bias may invalidate the PSM criteria.
- In this case, the study will utilize tests such as the **Sargan-Wu-Hausman** approach to check for selection bias from unobserved characteristics.
- In order to address the common support assumption, a large sample for the control group will be collected. This is to ensure that sufficient matches can be drawn.

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Thank you and have a great day !!!