Multidimensional Poverty Assessment of Using Dashboard Approach: The Case of the Upland Farming Households in Goa, Camarines Sur, Philippines

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Abstract

Poverty is a rural and multidimensional phenomenon. Hence, this paper assessed the multidimensional poverty of upland farming households in Goa, Camarines Sur using dashboard approach. The study employed a mixed of quantitative and qualitative method following the convergent parallel mixed method design. Additionally, the study used the Multidimensional Poverty Assessment Tool (MPAT) and in-depth interview in collecting the data. The study found dashboard approach as an effective way of providing substantial data and information in understanding the status of deprivation per dimension and subdimensions of poverty or well-being. Assessing the case of the upland farmers, the study revealed that that their inadequate ability to produce food and agricultural income as measured by their farm holdings, land tenure, and farm inputs; and their inadequate ability to generate non-agricultural income, and household wealth and their low access to formal credit facility have contributed to their poverty. Further, their exposure to idiosyncratic and covariate shocks also contributed in worsening their ability to generate farm and non-farm income

Keywords: *Rural sociology, new rurality, multidimensional poverty assessement tool, basic needs approach*

I. INTRODUCTION

Poverty is one of the common themes in social science literatures and one of the principal foci among international agencies advocating for the development of Third World Countries. Nevertheless, scholars and development agencies usually debate on the exact definition and measurement of poverty. In fact, Lemanski (2016) enunciated that there is no accurate definition of poverty and that the various measures of poverty accentuate different needs.

Sen (2001) argues that an income-based measure of poverty cannot adequately capture the poverty of a person because it fails to consider whether they can use those incomes to achieve their capabilities. Consequently, since the seminal work of Sen, and the pioneering work of bourguignon and Chackvavarty (2003) and Tsui (2002), poverty has been recognized as a multidimensional phenomenon (Alkire, Foster, Seth, & Santos, 2015; Batana, 2013). However, notwithstanding the growing interest in multidimensional poverty, very few empirical studies has been conducted in the Philippines (Datt, 2017). Generally, a monetary measure still dominates the studies on poverty in the country.

In Sen (1976) seminal paper "Poverty: An Ordinal Approach to Measurement," identified two steps that poverty measurement must address: (1) poverty identification, and (2) poverty aggregation. Poverty scholars (e.g. Ravallion, 2011; Alkire & Foster, 2007; Ferreira & Lugo, 2013) have no consensus on the most effective approach in poverty identification and aggregation, although they all agreed that poverty is a multidimensional phenomenon.

In aggregating poverty, scholars used two groups of methods (Alkire, et al., 2015). One group of methods is implemented using aggregate data for different sources while the other group of methods reflects the joint distribution and thus is performed using data in which the information on each dimension is available for each unit of analysis. Dashboard approach and composite indices approach belong to the first group of methods while Venn diagrams, dominance approach, statistical approach, fuzzy set approach, and axiomatic approach fall under the second group of methods.

Dashboard approach is considered as the simplest among the methods. Ravallion (2011), a sharp critique of a single index, favored this approach as it merely sets out information on the different dimensions. The dashboard in layman's term means the "progress report" or "report." This type of method was prominently and popularly implemented in presenting the progress or accomplishments of the MDGs. From

the dashboards, a percentage of deprived in each dimension (indicator) is performed. Dashboards are advantageous in augmenting the set of dimensions, presenting a significant amount of data, and potentially permitting the use of the best data source for each indicator and for assessing the impact of specific policies. However, it is disadvantageous for not reflecting a joint distribution of deprivation across the population (Alkire, et al., 2015). Although the approach is silent in identifying who is multidimensionally poor and does not provide a way of ranking countries, it provides an in-depth overview and analysis of the status of poverty particularly if it is used in a small geographical area. Additionally, the result on the dashboard is essential to understand which dimension needing more attention or priority.

Hence, this paper aims to explore dashboard approach as a method of measuring or assessing multidimensional poverty. A case study of the upland farming households in Goa, Camarines Sur, Philippines shows how the said approach was used.

II. METHODOLOGY

Research Design

The study used a mix of quantitative and qualitative methods to understand the intricacy of the problem. The need to combine approaches in poverty studies is likely desirable than the sole reliance on either qualitative or quantitative approach only (Carvalho & White, 1997; White, 2002; Hulme & Toye, 2006; Kanbur & Shaffer, 2007). The study employed a mixed method following convergent parallel mixed method design. This design converges or merges quantitative and quantitative data to provide a comprehensive analysis of the research problem (Creswell, 2014).

Research Locale

The study was conducted in Goa, Camarines Sur. Due to its proximity to mountainous areas the town can be divided into two landscapes – lowland and upland. It has 35 villages or barangays, 19 of which are considered as upland communities or with an upland portion. Additionally, the study was conducted from January to March 2018.

Participants

The main respondents of this study were the household-heads of the farming households. The study used multi-stage cluster sampling in which the dominant crops planted in the community served as the basis for the clustering of the villages. The dominant crops are *palay*, corn and vegetables. Table 1 shows the distribution of respondents per cluster.

Table 1. Respondents of the Study

Cluster	Number of classified communities	Number of farming households*	Sample size
Cluster A	8	84	51
Cluster B	6	73	51
Cluster C	5	96	51

*Number of farming households of the selected community

Data Gathering

The study adopted and modified the data collection instrument primarily developed through the initiatives of the International Fund for Agricultural Development (IFAD) called the Multidimensional Poverty Assessment Tool (MPAT). The MPAT provides a method for simplifying the complexity of rural poverty to support poverty alleviation efforts. MPAT uses thoroughly designed and tested purpose-built surveys to collect data on people's perceptions about fundamental and interconnected aspects of their lives, livelihoods, and environments. Standardized indicators, developed through a comprehensive participatory process, are then employed to combine, distill and present these data in an accessible way (Cohen, 2009). MPAT v.6 has been tested for its validity regarding structure and robustness. The data collected through MPAT was analyzed through weighted arithmetic average through the help of a Spreadsheet and MPAT User Guide (IFAD, 2014)

Instrumentation

Multidimensional Poverty Assessment Tool (MPAT) and in-depth interview in collecting the data. Aside from the MPAT, an in-depth interview was conducted to the respondents and key-informant interview to school head, health professionals, and village chiefs. Qualitative data of this study were analyzed through content analysis. According to Hsieh and Shannon (2005) qualitative content analysis is defined as “a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns” (p. 1278)

III. RESULTS AND DISCUSSIONS

A dashboard approach using radar chart as shown in Figures 2 was utilized to provide insights on the status of well-being/deprivation for each dimension and subdimension. The dimensions are based on the two theories – the Basic Needs Theory (Streeten & Burki, 1978; Streeten, Burki, Haq, Hicks, & Stewart, 1981)

ISSN 2449-4577 (online) 2408-283X (print)

and New Rurality (Rauch, 2009). The BNA or basic needs theory is an approach to social justice that gives priority to meeting people's basic needs – to ensure that there are sufficient, appropriately distributed basic needs, goods and services to sustain all human lives at a minimally decent level. This theory was used as a basis for determining the dimensions and sub-dimensions of well-being. In doing so, the MPAT, through the IFAD, has identified six basic needs such as food and nutrition security; domestic water supply; health and healthcare; sanitation and hygiene; housing clothing and energy; and education.

The "New Rurality" (Rauch, 2009) is a new approach to understanding recent reality of many rural people live now; a reality in which livelihoods may no longer be predominantly based on agriculture, a reality in which shocks, hazards, conflict, and the often-crippling effects of social, or gender-based, exclusion exert a negative impact on the lives of poor people. Four MPAT components go beyond immediate physical and cultural needs and address fundamentally relevant dimensions of rural livelihoods, life, wellbeing and poverty, such as farm assets (Molden, 2007; FAO, 2008), non-farm assets (Narayanamoorthy & Hanjra, 2006), exposure and resilience to shocks (IPCC, 2007; Graham, 2007), and social and gender equality (Vargas-Lundium & Ypeij, 2007).

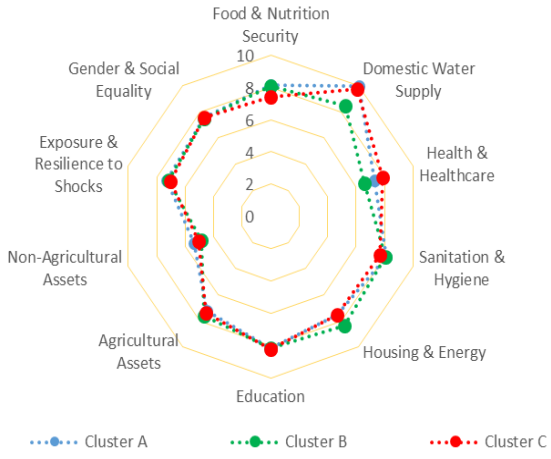

Figure 1. The Deprivation Score of Each Dimension by Cluster

For all these clusters, Domestic Water Supply and Education appeared to be the top dimensions with the highest average score of 9.41 and 8.18, respectively. It is followed by Sanitation and Hygiene, Food and Nutrition Security, and Housing and Energy with average scores of 7.96, 7.88 and 7.82, respectively. All the top five dimensions are part of the fundamental and basic needs. Among the ten dimensions, the Non-Farm Assets presented the lowest well-being/ deprivation average score of 5.08. Table 2 shows the deprivation score per dimension and sub-dimension.

Food and Nutrition Security. The dimension of Food and Nutrition Security (FNS) measures the stability and availability of sufficient quantities of adequately nutritious food to the household. It is the fourth dimension with the highest average well-being/deprivation score of 7.88. Regarding access stability, 74 percent of the farmers had never experienced a period longer than two weeks when there was not enough food. However, 6 percent of them claimed that they had suffered a one full day with no food to eat.

Nutrition Quality got the lowest score among the three sub-dimensions with an overall average rating of 6.15. The three common foods available in the dining tables of the upland farming households are rice (or corn as a substitute), vegetables, and fish.

Domestic Water Supply. The dimension of Domestic Water Supply (DWS) measures the likely quality of domestic water as well as the stability of supply and the household's access to it. It has the highest average score of 9.41, in which Cluster A got a perfect score of 10. The three dimensions of DWS has an average score of 9.4 for quality, 9.55 for availability and 9.47 for access stability.

Water is abundant in the upland communities of Goa. The town is known for its natural streams and rivers that traverse the different communities. These bodies of water are the primary reason why domestic water supply is not a problem in most upland communities of Goa.

Health and Health Care. This dimension measures the quality of health care based on health status, people's access to health care and the quality of care provided. It has a wellbeing/deprivation score of 7.23 and is part of the bottom three of the ten dimensions.

Cluster B has the lowest score of 6.56 mainly due to its distance to the nearest hospital or health center. Customarily, they do some self-diagnosis and self-medication for simple illnesses such as common colds, cough, fever, and flu. Moreover, due to the distance to nearest health facility, almost half (48%) of the farming households are more comfortable with faith-

Table 2. Deprivation score per dimension.

Dimension	Sub-dimension	Cluster A	Cluster B	Cluster C	Over-all
Food and Nutrition Security	Consumption	8.55	8.91	8.00	8.49
	Access Stability	9.29	8.61	7.37	8.42
	Nutrition Quality	6.01	5.95	6.49	6.15
Domestic Water Supply	Quality	10.00	7.81	9.61	9.14
	Availability	10.00	8.71	9.95	9.55
	Access Stability	10.00	8.70	9.73	9.47
Health and Health Care	Health Status	8.34	7.83	8.10	8.09
	Access & Affordability	6.92	6.21	6.43	6.52
	Healthcare Quality	6.30	5.25	9.20	6.92
Sanitation and Hygiene	Toilet Facility	7.65	7.63	6.47	7.25
	Hygiene Practices	8.92	8.76	9.19	8.96
	Waste Management	8.10	8.03	7.88	8.00
Housing and Energy	Housing Structure Quality	7.00	8.67	6.65	7.44
	Facility	9.51	9.61	9.71	9.61
	Energy Sources	6.09	6.53	7.53	6.28
Education	Quality	6.18	6.18	6.18	6.18
	Availability	8.88	8.88	8.88	8.88
	Access	9.20	9.21	9.38	9.26
Farm Assets	Land tenure	7.08	8.07	6.04	7.06
	Land quality	8.86	8.36	9.12	8.79
	Crop Inputs	7.22	7.17	7.66	7.35
	Livestock/ Aquaculture Inputs	5.73	6.16	7.41	6.43
Non-Farm Assets	Employment & Skills	4.65	4.56	4.61	4.61
	Financial Services	6.57	5.11	6.08	5.92
	Fixed Assets and Remittances	4.89	4.97	4.43	4.76
Exposure and Resilience to Shocks	Exposure	4.97	5.21	5.45	5.21
	Coping Ability	8.25	8.04	7.73	8.01
	Recovery Ability	8.55	8.20	7.85	8.20
Gender and Social Equality	Access to Education	8.49	9.06	8.80	8.78
	Decision Making	7.21	6.70	7.00	6.97
	Social Equality	7.00	7.00	7.00	7.00

Color Code:

Score (8.00 -10.0)	Score (6.0 -7.99)	Score (3.0 - 5.99)	Score (0 - 2.99)

healers, *albularyo* or *hilot*. They cited seven reasons why they preferred the *albularyo* over the health professionals: (1) the illness is not too severe that it requires professional help; (2) when the illness is believed to be "caused by" "engkanto" or supernatural bodies; (3) it is customary, particularly in the rural communities, to consult on *albularyo*; (4) the *albularyo* is more accessible particularly for remote rural communities; (5) strong belief for the *albularyo* over the medical experts or professionals; (6) most illnesses can be cured by the local *albularyo*; (7) usually, poor rural communities do not have adequate money to pay for medical help.

Sanitation and Hygiene. The dimension of Sanitation and Hygiene (SH) measures the quality of the household's sanitation (toilet facilities), food waste management and personal hygiene. SH is the third dimension with the highest average score of 7.96.

Toilet with flush is rare among farming households which accounts for 1.31 percent of the respondents. The majority are using the drop-and-store system or the conventional pit latrine. The common toilet structure of the household farmers is primarily made of nipa-thatch, anahaw or thick plastic water-proof sheeting. The bowl is usually made of precast cement. Alarmingly, 12 percent of the respondents are practicing open defecation

Housing and Energy. The dimension of Housing and Energy (HE) measures the general construction quality of the household's home, the

ISSN 2449-4577 (online) 2408-283X (print)

availability of the adequate facility and the quality of the energy sources used in the home (concerning indoor air pollution and fuel efficiency). HE got a score of 7.96, fifth among the 10 dimensions. A stable voltage electricity from the grid is the primary source of light for most of the respondents where 62 percent has a legal connection while 19 percent has an illegal connection who are primarily asking a favor from their neighbor or relatives for connection in exchange that they share payment for the monthly bills. Those who were not able to avail the connection from the grid endure on liquid fuel such as petrol or kerosene (12%) and candles (4%). Moreover, most of the respondents (80%) are using firewood as fuel source for cooking because it is readily available for pick-up within their surroundings in which they do not spend more money for it.

Education. The dimension of Education (EDU) measures the quality of children's formal education, its availability and accessibility to it. EDU is the second dimension with the highest average score of 8.18, in which its three subdimensions have an average score of 6.18 for quality, 8.88 for availability, and 9.26 for access.

Regarding the quality of education, the school heads/key-informants claimed that the overall performance of the students had improved moderately. These were based on promotion rate, and national achievement test (NAT) result. Teachers have adequate supplies of teaching materials. Although, these materials are generally from out-of-pocket (OOP) expenditures of the teachers. Most of the students have supplies such as notebook, pencil or pen, paper, etc. It is due to the implementation of *Pantawid Pamilyang Pilipino Program* or 4Ps, a social protection program of the government, implemented mainly to encourage the parents to enroll their children in school.

Farm Assets. The dimension of Farm Assets (FA) measures the household's general ability to produce food and create agriculture-based income. FA has an average score of 7.41, one of the lowest among the ten dimensions.

The average farmland/holding of upland farming households is 1.883 hectares which are 0.308 hectare above the 2012 Philippine Statistics Authority Census on Agriculture data on the average farm/holdings for Bicol Region (PSA, 2015). Moreover, seven out of 10 (73%) upland farmers have farms/holding of two hectares and below which implies that a great majority is a small farm holder. Half of them (50%) have at least a hectare dedicated to agricultural production.

Non-Farm Assets. The dimension of Non-Farm Assets (NFA) measures the household's non-agricultural income-generating ability, access to credit and household wealth. NFA has the lowest average score of 5.08 among the 10 dimensions. In general, the result implies that, in terms of generating income, upland farming households are dependent on subsistence farming.

Majority of the respondents (52%) perceived that they could not avail bank loans while only 40 percent perceived that they are bankable. Majority of the farming households reported five reasons why they do not avail loan from banks which can be extracted from the narratives of the respondents: (1) they prefer to borrow money from family, relatives, and friends than in banks; (2) they usually need a small amount or sometimes they just spend what they have; (3) banks are found in town centers distant from the remote communities; (4) they are anxious to avail the loan because of the fear that they may not be able to pay the monthly amortization due to the high interest rate; and (5) they perceived that they are not qualified due to the tedious requirements of the banks such as collateral and bank account. The result implies that the upland farming households have little access to formal credit facility.

Exposure and Resilience to Shocks. The dimension of Exposure and Resilience to Shocks (ERS) measures the households' exposure to natural and socio-economic shocks and its ability to cope and recover from shocks. ERS has the second lowest average score of 7.15 among the 10 dimensions mainly due to high exposure of the respondents to natural and socio-economic shocks with an average score of 5.21. The study of the Philippine Institute of Development Studies (PIDS) points out that the exposure of the households to natural disasters, together with other shocks has largely contributed to the vulnerability of the Filipino families to poverty (Mina & Reyes, 2017). The top five severe and likely to occur shocks that may affect the life, ownership, and livelihood of the upland farming households include typhoon (91%), family sickness (56%), drought (29%), unemployment (24%) and flood (24%). The three-mentioned natural disasters have brought negative impact to the agriculture sector in the Philippines in which *palay* farming is among the hardest hit because it is practiced in open areas. Moreover, among the socio-economic shocks, family sickness or illness and unemployment are

among the most damaging.

Gender and Social Equality. The dimension of Gender and Social Equality (GSE) measures the equality of access to education, and decision making for female and male children and adults, as well as the degree of social equality in the village/area. GSE scores an average of 7.54, the third least among the dimensions.

Most of the households (83%) have given their child/ren, whether male or female, an equal opportunity to study. However, one of 10 households provided male child/ren a priority than female and 8 percent have given female the priority to study than male. Male being given the priority is due to the cultural mindset of most Filipinos that male is the head of the household and the breadwinner. He then shall support his family with their needs, hence, he must have a good job. On the other hand, in some households, females are given the priority because females are most likely to pursue their studies than males.

IV. CONCLUSION

The paper shows how dashboard approach can provide substantial data and information on the status of deprivation per dimension and subdimension of poverty or well-being. In the case of the upland farming households in Goa, Camarines Sur, it was found out that the dimensions related to “New rurality” were the least scored dimensions. On the other hand, dimensions based on the basic needs have higher well-being scores. This implies that their inadequate ability to produce food and agricultural income as measured by their farm holdings, land tenure, and farm inputs; and their insufficient ability to generate non-agricultural income, and household wealth and their low access to formal credit facility have contributed to their poverty. Their exposure to idiosyncratic and covariate shocks also contributed to worsening their ability to generate farm and non-farm income.

The findings suggest that the development agencies in-charged in these areas may focus on these dimensions. Specifically, the government should focus more on livelihood or income generation of the upland farmers to make the program more sustainable. Three important dimensions – farm assets, non-farm assets and exposure and resilience to shocks, should also be emphasized to ease the intensity of deprivation among the farming households. These dimensions are the source of food and income for the upland farmers. Hence, their inability to produce food and income may affect other dimensions.

Specifically, the study suggests strengthening the Crop Insurance Program to provide a safety net among the farming household in case their livelihood was barely affected by extreme weather conditions. Institutionalizing sustainable livelihood program to capacitate the farming households so that in time they are waiting for the harvest time or period when they were not able to sow/plant crops due to weather condition, they still have another source of income. It should also intensify investments in and conduct of a thorough evaluation of infrastructure projects, such as irrigation and farm-to-market roads, especially in major agricultural areas (David & Inocencio, 2014). An accessible and comfortable credit facility could be done by expanding the access of the farmers to microfinance and encouraging the private banks to relax their lending requirements (Mina & Reyes, 2017).

Moreover, the use of the 10 dimensions of MPAT and the tool itself is appropriate in rural poverty assessments as it captures not only the basic needs but also the dimensions that covers the reality of contemporary rural conditions such as farm assets, non-farm assets, exposure and resilience to shocks and gender and social equality.

ACKNOWLEDGMENT

The researcher recognized the help of the local executives and participants of the study. He also acknowledges the help of his wife, April Lyn N. Cerio in data gathering.

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ISSN 2449-4577 (online) 2408-283X (print)