

THE ROLE OF INSTITUTIONS IN ALLEVIATING THE VULNERABILITY OF FARMERS TO POVERTY IN MALAYSIA: A LONGITUDINAL STUDY

Senadjki Abdelhak^{1*}, Jamalludin Sulaiman², Saidatulakmal Mohd³ and Azlinda Azman⁴

¹Faculty of Business and Finance, Universiti Tunku Abdul Rahman, MALAYSIA

^{2,3,4}School of Social Sciences, Universiti Sains Malaysia, MALAYSIA

*Corresponding author: abdelhak@utar.edu.my

Institutional support such as social and financial assistance play vital role in helping the poor deal with poverty. Nevertheless, institutions are often criticised for its delayed delivery and weak monitoring of programs. This study attempts to investigate the role of institutions in helping farmers deal with their vulnerabilities to poverty. A structured socio-economic questionnaire from a three-round panel survey undertaken at 6-month interval targeting the farmers in Kelantan and Terengganu, Malaysia is employed. The institution support is investigated in various areas that include effects on amount of production sold, head-count of cows, head-count of sheep and goats, head-count of hens and ducks, food storage and valuable things, savings and finally on farmers vulnerabilities. Results of the study indicate that institutions are inactive in providing assistance and support to farmers. Often, assistance is provided after an occurrence of a shock. Incidentally, the assistance provided does not reach all farmers, partly due to asymmetric information on the availability of the assistance or that farmers are not selected for the assistance. In most occasions, assistance is just not available to the farmers.

Keywords: vulnerability to poverty, longitudinal data, farmers, institutions, Malaysia

INTRODUCTION

Farmers' vulnerability to poverty is a complex phenomenon and the many overlapping factors contributing to the level of vulnerabilities include natural disasters, lack of entitlements and poor risk management strategies. Given the increasing global attention on the issue of farmers' vulnerability, there is an urgent need to help them respond to different types of risks.

Institutional support has been acknowledged as one of the crucial determinants to people's vulnerability to poverty. Institutional support is support

and aids provided by different bodies, such as government agencies and non-government organisations (NGOs). It also includes sets of rules, processes or practices that prescribe behavioural roles for actors, constrain activity, and shape expectations (Keohane, 1988). Institutional capacity refers to various social support associated with donors, such as authorities, communities, groups and individuals. Social support is assistance people received from institutions, communities, groups and individuals. The assistance is in the form of tangible elements, such as financial aids or intangible components, such as emotional help (Langford et al., 1997). The issue of institutional capacity is complex, because NGOs, international development partners and governments are frequently criticised for weak monitoring and evaluation of the impact of support programs to farmers.

Vulnerability is characterised by the attributes of persons, groups or communities with which threats and uncertainties, like climate change, natural disasters and other idiosyncratic risks are managed (Wolf, 2011; Sonwa et al., 2012; Berrang-Ford et al., 2012; Cinner et al., 2012; Turner, 2010). Christiaensen and Subbarao (2001) view vulnerability as the ex-ante potential of a decline in the future well-being or ex-ante probability of falling below the poverty line in a given society and at a given time. The term is also used in association with the inability of households, groups and communities to respond to risks through consumption level (Glewwe and Hall, 1998; Dercon and Krishnan, 2000) and failure to access expected utility (Ligon and Schechter, 2003) or in terms of the probability that a household has in becoming poor (Chaudhuri, Jalan and Suryahadi, 2002; Pritchett, Suryahadi and Sumarto, 2000).

This study attempts to investigate how institutional support helps Malaysian farmers to deal with their vulnerabilities. The study will attempt to achieve this objective by seeking answers to the following questions:

1. How programs and aids, which institutions provide to rural farmers to build their capacities, help them to overcome their vulnerability to poverty?
2. Do rural farmers have access to these programs?
3. Do these programs have a high impact to reduce the vulnerabilities of rural farmers?

INSTITUTIONAL SUPPORT AND POVERTY ALLEVIATION

Governments and NGOs often have programs aimed at building farmers' resilience. Studies such as Lawson, Gordon and Schluchter (2012) have indicated that such programs normally have a positive impact on the households' well-being and consequently reduce their vulnerability to poverty. This was also observed by Hinton and Earnest (2010) who carried out an ethnographic and interpretive qualitative fieldwork study with 70 women in the Wosera District,

East Sepik Province of Papua New Guinea. They concluded that social support and integration through social network programs had provided opportunities for social engagement and accessibility to resources and material goods to these women. Similarly, the qualitative analytical study on household and institutional levels conducted in El Salvador by Wamsler (2007) reveals that social housing organisations and micro-finance institutions (MFIs) have the potential to provide a powerful platform to support disaster risk management. Thus, social support can play a protective role as they provide services and assistance that might lessen and weaken the impact of various risks and threats. In cases where communities face covariate risks or other kinds of risks such as natural disasters, the government via its social support programs can act as a provider of basic needs to poor households so that they can better respond to such risks.

By providing farmers with access to various facilities, programs, and tangible and intangible support, they are able to respond adequately to the different kinds of risks that they encounter (Khandker, 2012; Fazey et al., 2010; Ramirez-Villegas et al., 2012; Fernández-Giménez, Batkhishig and Batbuyan, 2012; Cheng and Tao, 2010; Lybbert and Sumner, 2012). However, such interventions will only be effective if they empower farmers to manage the risks well enough to minimise the negative effects. According to Tubi, Fischhendler and Feitelson (2012) the positive effect of adaptive capacity can be seen when the capacity to cope with unfavourable events or risks increases.

Premchander (2003), who conducted a cross-sectional analysis on more than 90 countries asserts that NGOs, on the whole, were found to lead structural reforms by establishing specialised micro-financing institutions. In view of this, it can be argued that it is viable for people at risk to engage in investments that can increase their income which will subsequently strengthen their risk-management capacity. Chowdhury and Mukhopadhaya (2012) who utilised a mixed method approach with both an exploratory factor analysis and individual confirmatory factor analysis (CFA) found out that NGOs play a significant role in enhancing people livelihoods, especially in the social aspects of their well-being¹ even in situations where governments are already providing aid to them.

The value of adaptive capacity of states and institutions has been espoused by Baudoin, Sanchez and Fandohan (2013) who opine that farmers can deal better with risks if they have adequate institutional support. Similarly, Mcguire and Sperling (2008) who conducted a study on 399 farmers stress that institutions need to support farmers as co-strategists for interventions to be effective against vulnerability.

Some studies have looked into the benefits that farmers gain as a result of financial or educational programs by NGOs or government institutions. For instance, Ahsan (2005) who investigated the impact of health, family planning and education program of NGOs on poverty reduction in Bangladesh argues that these programs had improved their standard of living and children's educational level, which eventually reduced their vulnerability to poverty. Likewise, Walker

et al. (2009) argue that education plays an important role in vulnerability reduction because education affirms democratic values, such as human dignity, equality and freedom in people.

Other studies that have investigated the role of institutions in minimising the effects of risks and shocks on the rural poor include Garikipati (2008); Hailey and James (2003); International Strategy for Disaster Reduction (2008); Premchander (2003); Bastiaensen, De Herdt and D'exelle (2005); Francis (2002); Barrett, Lee and Mcpeak (2005); Benson, Twigg and Myers (2001); Adger (2000); Eakin (2005).

Premchander (2003) studied the issue of poverty reduction among women in India and discovers that institutions are best placed to empower people as they have the greatest potential to meet the needs of the poor appropriately and effectively. Hailey and James (2003) who focused on capacity building programs agree that community groups, NGOs and other civil society organisations are the well-positioned to help the poor tackle poverty, ill health, environmental degradation, social injustice and also to mitigate the after-effects of social conflicts and disasters. However, institutions cannot effectively empower poor farmers to respond to risks if they are weak and not resilient (Firman et al., 2011; Dalziell and McManus, 2004).

Researchers have also noted that interventions can sometimes be counter-productive and lead farmers to be more vulnerable. For instance, Bonnin and Turner (2011) found out that some agricultural programs have resulted in new food insecurities and vulnerabilities among rural communities in Vietnam. They, thus, suggest that government authorities need to understand how ethnic groups in Vietnam behave, view and interpret these programs to maximise the anticipated benefits.

Sun et al. (2011) studied the impact of government aid using a set of geographical and household characteristics as variables and noted that only a relatively small number of households had average revenue below the poverty line after receiving government post-disaster subsidies. However, these households still had a high probability of moving back into poverty in the future. Chhotray and Few (2012), who adopted a qualitative research analysis in India, found that the combination of risks, poor grassroots adaptive capacity, and weak institutional support deeply undermines recovery from an impoverished state. Their findings raise some interesting questions that should be investigated for a more in-depth understanding of the relationship that exist between institutions, farmers and communities. Among the questions that need answers are: what makes institutional capacity weak, what are the factors that determine or affect their (institutions) resilience, do institutions lead farmers to fall into poverty traps, and if this is so, how does it happen.

Many studies have showcased the importance of institutions on farmers' well-being but they also posit that there are major constraints that hinder vulnerability reduction. For instance, chronically poor farmers may fail to gain

access to NGOs and other institutions, such as CBOs (Community Based Organizations) if they have no access to land, financial and political institutions, assets and education.

Thorp, Stewart and Heyer (2005) argue that land is an essential asset for participation in agricultural cooperatives. Hence, inaccessibility to land may be constraining force for the moderate poor while excluding the chronic poor from such initiatives. Also, inadequate accessibility to networks reduces the opportunities to obtain sufficient information that will provide farmers with new avenues to generate income and improve their well-being. This finding is supported by Premchander's (2003) study on micro-financing institutions for poverty reduction in India which reveals that cooperatives have recorded both success and failure in their efforts.

On the whole, available literature on vulnerability reduction efforts by institutions provides a clear understanding of the link between farmers' coping strategies, government policies and institutions such as NGOs. However, there is still limited understanding on the role of institutions and other resource actors and their position in reducing households' vulnerability (Miller, 2008).

METHODOLOGY

Data

Data were collected from a three-round panel survey undertaken at 6-month intervals to allow the measurement of seasonal variation in behaviour and outcome, and to balance both cross-sectional and time series requirements of panel data. The first round was conducted in December 2010 where 460 questionnaires were distributed to the respondents. The second round in June 2011 could only be conducted with 386 respondents as the others were not reachable. The researchers decided not to follow up with those left out after several attempts to reach them did not succeed. The third round was conducted in January 2012 where 328 questionnaires were administered. From these 328 questionnaires, only 301 were considered valid and used in the analysis.

Variable Measurement

Vulnerability to poverty

This study employed the method used by Chaudhuri (2003) and Chaudhuri, Jalan and Suryahadi (2002). They had used the Vulnerability as Expected Poverty (VEP) as the main variable. VEP is defined as the probability level that farmers may face in falling back into poverty in the future.

Therefore, the vulnerability of farmer i at time t can be written as:

$$VEP_t^i = \Pr(I_{t+1}^i \leq PLI) \quad (1)$$

where I_{t+1}^i is the per capita income of farmer i at $t+1$ time and PLI is the poverty line income.

It is assumed that farmer's per capita income is a function, in general, of farmer's capacities (assets), idiosyncratic and covariate risks that it experiences, its abilities to cope with and manage these risks and institutional supports. By assuming that per capita income is log-normally distributed, therefore farmer i 's per capita income can be expressed as follows:

$$\ln I_{t+1}^i = X_{ijt} \beta_{ijt} + \theta_{ijt} \quad (2)$$

while:

$$X_{ijt} = (A_{ijt} \alpha_f + CR_{ijt} \beta_k + IR_{ijt} \gamma_1 + RMS_{ijt} \delta_m + CS_{ijt} \delta_n + IS_{ijt} \tau_o) \quad (3)$$

where $\ln I_{t+1}^i$ is the future normal log of per capita income, with θ_{ijt} representing the unobserved permanent earning determinant as well as the transitory component of earnings (Bourguignon, Goh and Kim, 2004). A_{ijt} represents farmers' capacities (assets) of farmer i in cohort j at time t , CR_{ijt} represents farmers' coping strategies and RMS_{ijt} represents farmers' risk management strategies. CR_{ijt} represents the covariate risks that farmers are exposed to and IR_{ijt} represents the idiosyncratic risks that farmers are exposed to. Next, IS_{ijt} represents the institutional supports. $\tau_o, \beta_k, \gamma_1, \delta_m, \delta_n, \alpha_f$ are the vectors of parameters.

Accordingly, we assume that the residual term θ_{ijt} follows an autoregressive process AR(1) (Bourguignon, Goh and Kim, 2004):

$$\theta_{ijt} = \rho_t \theta_{ijt-1} + \varepsilon_{ijt} \quad (4)$$

where ε_{ijt} is the innovation in earnings and is supposed to have a variance $\sigma_{\varepsilon_{ijt}}^2$

As the repeated cross-sectional data are available for periods $t = 1, 2,$ and 3 ; and the sample is representative of the whole population in each period, therefore, the sample of individuals belonging to each cohort j is observed in each

period. It is thus possible to follow cohort j over time (Bourguignon, Goh and Kim, 2004). If observations are well-specified and done in adequate time; which is technically three cross-sections data allowing the estimated Equation 2 (Bourguignon, Goh and Kim, 2004), then the estimated $\hat{\rho}_i$ and $\hat{\sigma}_{\varepsilon_{ijt}}^2$ will have the expected signs and magnitude, that is, $1 > \hat{\rho}_i > 0$ and $\hat{\sigma}_{\varepsilon_{ijt}}^2 > 0$ for all t .

Some assumptions are necessary for estimating the future per capita income. The first assumption is that the innovation term is distributed as normal as with mean 0 and variance $\hat{\sigma}_{\varepsilon_{ijt}}^2$, so that earnings are distributed as a lognormal variable, conditional on individual X_{ijt} . The second assumption is that some predictions of future individual characteristics \hat{X}_{ijt+1} might have to be assumed as being stationary. The same applies to future earning coefficients $\hat{\beta}_{ijt+1}$ and the variance of the innovation $\hat{\sigma}_{\varepsilon_{ijt+1}}^2$. In both cases, the simplest assumption is that the parameters are stationary (Bourguignon, Goh and Kim, 2004).

Under preceding assumptions, and denoting θ_{ijt} , the estimated residual of the earning Equation 2 in period t , the probability of earning less than a poverty threshold PLI at time $t+1$, conditional on characteristics of period t is given by:

$$VEP_t^i = \begin{cases} \phi \left(\frac{\ln \text{PLI} - \hat{X}_{ijt+1} \hat{\beta}_{ijt+1} - \hat{\rho}_i \hat{\theta}_{ijt}}{\hat{\sigma}_{\varepsilon_{ijt+1}}^2} \right) & \text{if } I_{t+1}^i \leq \text{PLI} \\ 0 & \text{if } I_{t+1}^i > \text{PLI} \end{cases} \quad (5)$$

with ϕ being the cumulative log-normal distribution function.

The farmer with a VEP greater than, or equal to, 0.5 is considered to have not put an end to his or her state of poverty and therefore will be considered as vulnerable to poverty (Chaudhuri, Jalan, and Suryahadi, 2002).

In Malaysia a household is considered poor if its income is less than his own PLI, that is, he lacks the resources to meet the basic needs of his family members. A household is also considered poor if the per capita income is less than the PLI (which is RM194 per month per capita) (Economic Planning Unit, 2010).

Institutional capacity

An institution can be any NGOs, government bodies, international organisations, community-based organisations and social service organisations that are motivated to meet the needs of the most disadvantaged people in the society, either through direct services to them or through indirect services to other voluntary groups (Bhose, 2003). The role of these institutions is to provide a variety of support to disadvantaged individuals, farmers and groups such as health, education, and training and to provide resources that would strengthen the capacities of those individuals, farmers and groups such as assets. In this study, farmers were asked to indicate, from a given list, the programs that they have had access to within the last six months and state how the programs would benefit them. They also had to indicate the reasons why they were not given access to some of the programs.

Farmers capacity

Farmers' capacity is measured as the total set of assets that farmers own or have access to. An asset is identified as a stock of financial, human, natural, physical or social resources that can be acquired, developed, improved and transferred across generations. It generates flows or consumption, as well as additional stock (Moser, 2006).

RESULTS

This section analyses the impact of the institutional assistance on farmers' capacities (assets) as well as the impact of institutional support on farmer vulnerability. Farmers were asked to indicate the institutional assistance that they have received from various institutions. Institutional assistance is measured in terms of the accessibility to various services provided by institutions to farmers. This assistance includes access to farm mechanics, marketing, employment, irrigation, weather information and financial aids.

If farmers have access to the market, employment, irrigation and weather information, then the variables are coded as "1". If farmers do not have access to the aforementioned services then the variables are coded as "0". Financial aid is measured as the amount in RM1,000 that farmers received from the institutions. The linear regression model for the panel data analysis was used to determine how institutions can contribute to build farmers' capacities measured by variables such as the increase in the amount of the production sold, managed land, head counts of cows, sheep, goats, hens and ducks, food storage and valuable things, and savings.

In order to facilitate interpretation of the results, the dependent variables were measured using the Log function. In this study, we used Ad hoc solutions, which add small positive numbers to all zeros (Shepherd, 2008). The Hausman test was used to identify the appropriate method (mixed effect or random effect) for the analysis of data and it revealed that the fixed effect method is the most appropriate for the analysis and was consequently used in this study.

Effect of Institutional Assistance on the Amount of Production Sold

Table 1 illustrates the impact of institutional assistance on the amount of the production sold. The examination of the results (Table 1) discloses that the model is significant ($F = 4.91, p = 0.0001$). The model explanatory power value is equal to 0.645 which indicates that 64.5% of the model is explained by the predictors. Among six variables in the model, there are three significant variables at 5% level of significance namely access to farm mechanics ($t = 1.940, p = 0.050$), access to market ($t = 4.510, p = 0.000$) and access to financial resources ($t = 2.690, p = 0.007$). The results displayed in Table 1 reveals that if farmers get access to the farm mechanics then the amount of production sold would increase by 30.55% and if farmers get access to the market, then the amount of production sold would increase by 124.4%. There will also be an increase in the amount of production sold by 80.51% for any additional RM1,000 received from institutions. Other variables such as access to employment, irrigation and weather information are not statistically significant in increasing the amount of production sold even at 10% level of significance.

Table 1: The effect of institutional assistance on the amount of production sold

	Coef.	Std. Err.	<i>t</i>	P > <i>t</i>
Constant	6.7078***	0.0911	73.6200	0.000
Access to farm mechanics	0.2666**	0.1376	1.9400	0.053
Access to market	0.8083***	0.1793	4.5100	0.000
Access to employment	-0.1382	0.2117	-0.6500	0.514
Access to irrigation	-0.1696	0.3068	-0.5500	0.581
Access to weather information	0.1736	0.3130	0.5500	0.579
Access to financial aids (RM1,000)	0.8051***	0.2997	2.6900	0.007
R-sq = 0.645		F-Statistic = 4.91		Prob > F = 0.0001

Table 2 demonstrates the influence of institutional assistance on farmers' skills in the management of lands. The results (Table 2) indicate that the model is significant ($F = 9.84, p = 0.0001$). The coefficient determination (R^2) is equal to 0.680. This means that 68% of the model is explained by the selected variables. Two out of five variables in the model are found to be statistically significant at

5% level of significance namely access to farm mechanics ($t = 2.130, p = 0.034$), access to the market ($t = 6.190, p = 0.000$). Meanwhile, there are three variables which are statistically significant but only at 10% level of significance namely access to employment ($t = -1.790, p = 0.074$), access to weather information ($t = 1.830, p = 0.068$) and access to financial resources ($t = 1.680, p = 0.094$).

Table 2: The effect of institutional assistance on the size of land managed

	Coef.	Std. Err.	t	$P > t$
Constant	0.618***	0.031	19.730	0.000
Access to farm mechanics	0.150**	0.070	2.130	0.034
Access to market	0.383***	0.062	6.190	0.000
Access to employment	-0.083*	0.046	-1.790	0.074
Access to irrigation	-0.026	0.104	-0.240	0.807
Access to weather information	0.185*	0.101	1.830	0.068
Access to financial aids (RM1,000)	0.167*	0.099	1.680	0.094
R-sq = 0.680 F-Statistic = 9.84 Prob > F = 0.0001				

In the meantime, access to irrigation ($t = -0.240, p = 0.870$) is not statistically significant in increasing farmers land management even at 10% level of significance. The results reveal that when farmers gain access to all the following: farm mechanics, marketing, weather information, and financial aids (for an additional RM1,000), then their managed land would have increased by 16.18%, 46.66%, 20.32% and 16.7%, respectively. Meanwhile, if farmers gained access to employment then their managed land would decrease by 7.96%.

Effect of Institutional Assistance on Head of Cows

Table 3 depicts the results of the impact of institutional assistance on farmers' head-count of cows. The analysis indicates that the model is significant with F-ratio equal to 3.39 and probability $p = 0.0027$. The determination coefficient (R^2) is equal to 0.600. This reveals that 60% of the model is explained by the selected variables.

There are two variables in the model that are statistically significant at 5% level of significance namely access to market ($t = 2.910, p = 0.004$) and access to weather information ($t = 2.170, p = 0.030$). The results reveal that farmers who had access to the market and weather information increased the head of counts of cows by 13.42% and 17.82%, respectively. In the meantime, there are three variables that are statistically insignificant even at 10% level of significance namely access to employment ($t = 0.210, p = 0.836$), access to irrigation ($t = 0.050, p = 0.964$) and access to financial resources ($t = 1.100, p = 0.272$).

Table 3: The effect of institutional assistance on the head-count of cows

	Coef.	Std. Err.	<i>t</i>	P > <i>t</i>
Constant	0.153***	0.022	6.930	0.000
Access to market	0.126***	0.043	2.910	0.004
Access to employment	0.011	0.051	0.210	0.836
Access to irrigation	0.003	0.074	0.050	0.964
Access to weather information	0.164**	0.076	2.170	0.030
Access to financial aids (RM1,000)	0.080	0.072	1.100	0.272
R-sq = 0.600 F-Statistic = 3.39 Prob > F = 0.0027				

Effect of Institutional Assistance on Head of Sheep and Goats

Table 4 illustrates the results of the effect of institutional assistance on farmers' head-count of sheep and goats. The results (Table 4) indicate that the model is significant at 1% level of significance ($F = 6.11$, $p = 0.001$). The explanatory power (R^2) is equal to 0.680. This indicates that 68% of the model is explained by the selected predictors.

Table 4: The effect of the institutions assistance on the head-count of sheep and goats

	Coef.	Std. Err.	<i>t</i>	P > <i>t</i>
Constant	0.153***	0.028	5.550	0.000
Access to market	0.091*	0.054	1.690	0.092
Access to employment	-0.030	0.064	-0.470	0.641
Access to irrigation	-0.023	0.093	-0.250	0.803
Access to weather information	0.506***	0.095	5.340	0.000
Access to financial aids (RM1,000)	0.069	0.091	0.760	0.450
R-sq = 0.680 F-Statistic = 6.11 Prob > F = 0.0001				

Only access to weather information ($t = 5.340$, $p = 0.000$) is statistically significant at 5% level of significance. By contrast, access to the market ($t = 1.690$, $p = 0.092$) is found to be significant only at 10% level of significance. The analysis shows that if farmers had access to the market and weather information, then the sheep and goat count would increase by 9.52% and 65.86 respectively. Other variables such as access to employment ($t = -0.470$, $p = 0.641$), access to irrigation ($t = -0.250$, $p = 0.803$) and access to financial aids ($t = 0.760$, $p = 0.450$) are statistically insignificant even at 10% level of significance.

Effect of Institutional Assistance on Head-count of Hens and Ducks

Table 5 shows the results of the impact of institutional assistance on the head count of hens and ducks. The analysis shows that the model is significant with the F-ratio equal to 7.48 and probability $p = 0.0001$. The coefficient of the determination (R^2) is equal to 0.608. This reveals that 60.8% of the model is explained by the selected variables.

There is only one variable in the model which is statistically significant at 5% level of significance namely access to the market ($t = 2.500, p = 0.013$). The results also indicate that when farmers gained access to the market, their hens and ducks would have increased by 7.03%. Contrastingly, there are four variables found to be statistically insignificant even at 10% level of significance namely access to employment ($t = -1.390, p = 0.166$), access to irrigation ($t = -0.600, p = 0.549$), access to weather information ($t = -1.200, p = 0.232$) and access to financial resources ($t = 1.630, p = 0.103$).

Table 5: The effect of institutional assistance on hens and ducks

	Coef.	Std. Err.	<i>t</i>	P > <i>t</i>
Constant	2.667***	0.014	186.720	0.000
Access to market	0.068**	0.027	2.500	0.013
Access to employment	-0.045	0.033	-1.390	0.166
Access to irrigation	-0.028	0.047	-0.600	0.549
Access to weather information	-0.058	0.049	-1.200	0.232
Access to financial aids (RM1,000)	0.077	0.047	1.630	0.103
R-sq = 0.608 F-Statistic = 7.48 Prob > F = 0.0001				

Effect of Institutional Assistance on Food Storage and Valuable Things

Table 6 demonstrates the effect of institutional assistance on farmers' food storage and valuable things. The results (Table 6) indicate that the model is significant ($F = 9.91, p = 0.000$). The coefficient determination (R^2) is equal to 0.604. This means that 60.4% of the model are explained by the selected variables. One out of five variables in the model is found to be statistically significant at 1% level of significance namely access to the market ($t = 3.040, p = 0.002$). However, there is only one variable found to be statistically significant but only at 5% level of significance namely access to employment ($t = 2.290, p = 0.022$). Also, the access to weather information ($t = 1.710, p = 0.088$) and access to financial resources ($t = 1.650, p = 0.100$) are statistically significant but only at 10% level of significance.

Table 6: The effect of institutional assistance on food storage and valuable things

	Coef.	Std. Err.	<i>t</i>	P > <i>t</i>
Constant	5.151***	0.050	102.370	0.000
Access to market	0.289***	0.095	3.040	0.002
Access to employment	0.261**	0.114	2.290	0.022
Access to irrigation	-0.245	0.167	-1.470	0.141
Access to weather information	0.281*	0.164	1.710	0.088
Access to financial aids (RM1,000)	0.263*	0.160	1.650	0.100
R-sq = 0.604 F-Statistic = 9.91 Prob > F = 0.000				

The results demonstrate further that when farmers had gained access to the market, employment, weather information and financial resources (for an additional RM1,000), then their food storage and valuable things would also increase by 33.5%, 29.82%, 32.44% and 26.3% respectively. Only their access to irrigation ($t = -1.470$, $p = 0.141$) is found to be statistically insignificant in increasing their food storage and valuable things even at 10% level of significance.

Effect of Institutional Assistance on Saving

Table 7 highlights the impact of institutional assistance on farmers' savings. The results (Table 7) indicate that the model is significant ($F = 20.28$, $p = 0.000$). The coefficient determination (R^2) is equal to 0.696 which means that 69.6% of the model is explained by the selected variables. None of the variables is found to be statistically significant. Access to the market ($t = -0.240$, $p = 0.814$), access to the irrigation ($t = 0.050$, $p = 0.959$) and access to financial resources ($t = 0.090$, $p = 0.930$) are statistically insignificant even at 10% level of significance.

Table 7: The effect of institutional assistance on savings

	Coef.	Std. Err.	<i>t</i>	P > <i>t</i>
Constant	5.976***	0.079	75.170	0.000
Access to market	0.174	0.156	1.120	0.264
Access to employment	-0.058	0.183	-0.320	0.750
Access to irrigation	0.014	0.266	0.050	0.959
Access to weather information	-0.064	0.273	-0.240	0.814
Access to financial aids (RM1,000)	0.023	0.260	0.090	0.930
R-sq = 0.696 F-Statistic = 20.28 Prob > F = 0.000				

Effect of Institutional Assistance on their Vulnerabilities

Table 8 provides the summary of the results of the impact of institutional assistance on farmers' vulnerabilities. The results illustrate that the regression model is significant ($F = 4.27, p = 0.000$). The coefficient of determination (R^2) is equal to 0.613. This means that 61.3% of farmers' vulnerability is explained by the selected predictors.

Table 8: Effect of institutional assistance on their vulnerabilities

	Coef.	Std. Err.	<i>t</i>	P > <i>t</i>
Cons	0.363***	0.081	4.500	0.000
Access farm mechanics	-0.664***	0.118	-5.620	0.000
Access to weather information	-0.207	0.311	-0.670	0.506
Access to financial aids (RM1,000)	-0.490**	0.251	-1.960	0.050
Access market	-0.840***	0.146	-5.800	0.000
Access employment	0.170**	0.077	2.203	0.034
Access irrigation	0.122	0.263	0.460	0.643

R-sq = 0.613 F-Statistic = 4.27 Prob > F = 0.0000

The results show that only three out of six types of institutional support are statistically significant at 5% level of significance namely access to farm mechanics ($t = -5.620, p = 0.000$), access to market ($t = -5.800, p = 0.000$) and access to financial aids ($t = -1.960, p = 0.050$). The results show that farmers who get financial aid (for every RM1,000) would have their vulnerabilities decreased by 0.490. Also, farmers who can easily access the market can reduce their vulnerabilities by 0.568. Surprisingly, access to employment ($t = 2.203, p = 0.034$) is found to be significantly increasing farmers' vulnerabilities. Other mechanisms of support such as access to weather information ($t = -0.670, p = 0.506$), and access to irrigation ($t = -0.460, 0.643$) are insignificant even at 10% level of significance.

DISCUSSION

This study has established that some programs and support that were provided to farmers were significant in reducing their vulnerabilities (Table 8). Nevertheless, on the whole the study has found that the respondents had access to only a limited number of programs. These programs were mostly the ones provided by government institutions and NGOs such as Farmers Organization's Authority of Malaysia or Lembaga Pertubuhan Peladang (LPP); Malaysia Agricultural

Research and Development Institute (MARDI) Terengganu; Tabung Ekonomi Kumpulan Usaha Niaga (TEKUN); Amanah Iktiar Malaysia (AIM); Poverty Eradication Foundation or Yayasan Basmi Kemiskinan (YBK). Additionally, they had also gained access to the Development Program for the Hardcore Poor or Program Pembangunan Rakyat Termiskin (PPRT); People's Livelihood Development Scheme or Skim Pembangunan Kesejahteraan Rakyat (SPKR) and Integrated Rural Development Program for the isolated people or Program Sepadu Pembangunan Desa Terpencil (PSPDT). Some of the respondents were unable to access these programs because of lack of information.

According to the data collected from respondents who had no access to any programs, 68.28% said that they had not received any information on the programs, 18.65% knew about the program but were not selected while the remaining 11.56% could not participate because there were no such support programs for farmers in their area.

Access to financial aid, marketing and farm mechanics were the only programs that showed a significant effect on farmers' vulnerability to poverty (Table 8). All these three kinds of access led to the increase in farmers' assets such as the amount of production sold, size of managed land, the number of animals, food storage and valuable things and savings (Table 1 to Table 7). Farmers who received financial aids found good opportunity to accumulate and/or increase their assets' capacity by purchasing necessary tools and equipment that are essential for their farming activities.

The lack or even the absence of financial resources propelled farmers to adopt strategies that could be detrimental to their well-being. For instance, some had resorted to selling their productive assets that would lead to permanent lower future consumption which in turn might affect their health condition as well. Therefore, it is crucial that poor farmers are given access to financial resources to stop them from adopting strategies that could exacerbate their well-being. As indicated in the findings, 33.66% of the farmers sold their productive assets while 33.88% collected and sold natural resources because they had not received any financial aid.

The findings also indicate that the majority of farmers who had access to financial resources and loans were farmers who owned bigger plots of land and those who were not classified as poor. Hence, this makes the effort to alleviate poverty and reduce vulnerability to poverty more difficult.

Bigger land area alongside easy access to the market, equipment and facilities will contribute to increased production and sale. This will enable these farmers to accumulate a considerable amount of savings and livestock and be well prepared for any uncertainties. The provision of physical and non-physical facilities and support such as access to new technologies and training on how to use these technologies, market and financial institutions are vital to ensure that rural communities are well prepared to cope with, and manage any eventualities.

Although access to weather information helped farmers to increase food storage and valuable things (Table 6), this did not help them to reduce their vulnerability (Table 8). Weather information allowed farmers to manage against natural disasters such as floods. Floods can have severe economic consequences, yet weather information was not enough to reduce their vulnerability to the floods although they had equipped themselves with food stock, etc. This paper argues that merely providing farmers with weather information is insufficient unless they have the appropriate tools and knowledge to deal with natural disasters such as floods which will build their capacities to manage risks.

Access to employment increased the farmers' food storage and valuable things (Table 6) but simultaneously, it also decreased the size of the managed land (Table 2). This has exposed them to a more vulnerable future. In some cases, they preferred to engage in off-farm activities which resulted in the unintentional neglect of their lands. Some had sold their lands or leased them. Even though access to employment had stabilised farmers' revenues, it failed to safeguard farmers from being vulnerable. In fact it had driven them further into the poverty trap (Table 8), and this indicates that farmers who had access to employment had made decisions that will be detrimental to their well-being. Hence, this study argues that access to employment opportunities can significantly increase farmers' vulnerabilities. Since most of the respondents have a relatively low level of formal education, they receive low wages. Compared to farmers who were involved in farming activities (in which they excelled), farmers who shifted to off-farm activities were found to be more vulnerable. Data also indicate that 62.5% of farmers who gained employment were found to be vulnerable, while only 37.5% of farmers who did not have permanent employment were found to be vulnerable. Access to employment could only be productive if farmers had a good education level that guaranteed reasonable wages.

Although various kinds of programs and aid were available to farming communities these were only made available after they are exposed to risks. For instance, both government and non-government institutions provide such aid only after the occurrence of disasters such as flooding. According to the findings, more than 78% of the respondents who received assistance have reported that they only received aid after such incidents. This also affirms the argument that institutions only provide information about weather conditions and possible calamities before they occur without any other form of assistance prior to the disaster.

Hence, farmers have to mainly rely on their own coping strategies rather than risk management strategies against severe threats. As most of the respondents were poor, their coping strategies in many cases drove them to vulnerability as discussed earlier. The higher the level of poverty, the more disastrous the strategies will be and as such, the more vulnerable the farmer is to chronic poverty. This claim is substantiated by the findings that the hard-core poor and poor farmers are most likely to adopt strategies that were a threat to

their future livelihood. This explains why farmers' risk management and coping strategies are disparaging to their livelihoods.

CONCLUSION

On the whole, it has been found that institutions and NGOs were less active in providing assistance and support to farmers. Instead of providing the necessary aid to farmers before risks occurred, institutions were active only afterwards. Some farmers could gain access to the assistance provided by these institutions while some others had not received any assistance due to several reasons. Some lacked reliable information, while others were not selected or there were no programs available in their areas. Access to farm mechanics, financial resources and market significantly contributed to farmers' well-being as these resources increased their assets and strengthened their capacities, thus, securing them from falling into the poverty trap. Although access to employment could well stabilise farmers' revenues, it had failed to safeguard farmers from being vulnerable and also falling into the poverty line in the future.

NOTE

1. Social aspects of well-being is the access to information, loan, education, health and job, freedom of doing social, cultural, religious and political works, participation in society and politics and voting behaviour, decision at household and work place.

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