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IMPACTS OF NATURAL DISASTERS ON FARMS AND FARMERS IN MALAYSIA

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Natural disasters particularly floods and land sliding in Malaysia are frequently caused by climate changes. The impacts are also faced by farms and farmers in the form of production loss, farm infrastructure and even on psychology of farmers. Consequently, agricultural sector is becoming more risky which would affect food security of the country. Current research was carried out to assess the level of impacts of natural disasters on farms and farmers in the last five years. The impact level was measured on the scale of low, medium and high. The respondents were 360 farmers who were selected through one of the probability sampling techniques. The results revealed that climate changes in the form of natural disasters highly destroyed farm production, crashed irrigation and drainage facilities, and negatively affected emotions and psychology of farmers. The study recommends that various agricultural players such as public and private organizations, researchers, academia, students and policy makers are required to ponder profoundly on the impacts level and formulate strategies to facilitate farmers and their farms.

Keywords: agriculture, natural disasters, adaptation, climate change, Malaysia.

Introduction

The intensity of natural disasters is increasing on account of climate changes at the global level. According to Sawada and Takasaki [9], Klomp and Hoogezand [6], natural catastrophes have adversely affected human lives, livelihood and socio-economic structure of both developing and developed world. Malaysia is one of the countries being affected by climate changes [1, 4]. In the context of Malaysia these climate changes are also a source of floods, land sliding and drought [8].

According to Shaari et al. [11], the history of Malaysia has witnessed numerous floods such as flood of 1965 adversely affected 300, 000 people. Likewise, the series of floods in 1996 caused damage of 97.8 mln dollars, damage of 0.35 mln dollars in 2000 and smash of 489 mln dollars in 2007, that not only affected physical infrastructure but also disturbed economic growth of the country [11]. Mustafa [8] further added that droughts were also part of history in Malaysia. The author mentioned that Sabah state faced severe absence of rainfall in 1998 which affected more than 7200 farming community; the national staple crop (paddy) were badly damaged; aggregate financial loss was approximately 87 mln Malaysian Ringgits (MYR). The author further narrated that the state of Malacca faced severe drought which affected availability of water and caused drying of dam in 1999.

Consequently, Malaysia has been facing various natural disasters due to climate changes adversely affecting common people, farmers and agricultural sector which are a point of concern for various stakeholders. That is why the present study was designed to examine level of impacts of natural disasters on farms and farmers in Malaysia. The findings would be useful for policy makers, public and private sectors, researchers and resource poor farmers to deeply concentrate on impact levels from the future lens and design measures to avoid farmers' losses.

Methodology

In order to evaluate impacts of natural disasters, 50 farmers were randomly selected as pre testing of the questionnaire design. These 50 respondents were excluded in the final administration of the research. After refinement of the questionnaire, 360 farmers were selected through multi stage cluster sampling technique, during the end of the year 2015 to mid of 2016. It was assumed that these farmers were either victims of natural disasters or prone to natural disasters. The respondents were informed about the objective of the study. After green signal to carry on research from the farmers, questions reflecting impacts of natural disasters on farmers and farmers during last 5 years were asked on the scale of low, medium and high. The data were gathered through the help of local enumerators who were trained in handling questions

and keeping the moral high of the respondents during face to face interview. Furthermore, statistical analysis was performed on SPSS (version 21) to generate survey statistics: frequency distribution, percentage, mean and standard deviation.

Results and Discussion

The level of impacts of natural disasters in the last five years from the lens of farmers are presented in Table. According to the findings, natural disasters had highly affected farm production (mean=2.57). In fact, farmers are always concerned about the farm production as it is the main source of livelihood. Additionally, farm production is also used at the domestic level such as wheat, rice, maize and other crops may act as staple crops and farmers rely on that crop till next harvest to feed and get feed. Xu et al. [12] stated that severe natural calamities had negatively impacted grain production in Jilin province of China. Thus, it demonstrates that farm production is being highly affected by meteorological changes.

Another high impact created by natural disasters were on irrigation and drainage with mean of 2.28. In this context, climate changes may create scarcity of water and damage irrigation and drainage facilities at the farm level. This issue could lead to less crop production and price hike of crops at the market level which could further exploit by middle men. Additionally, the frequent floods also smash the existing drainage infrastructure at the farm level. This problem also breed problem for the public sector and farming community to rebuild for future purposes. Therefore, farmers are sensitive about their irrigation and drainage facilities and any obstacle create hindrance in the flow of agricultural activities.

The next important impact of natural disasters were on emotion and psychology of farming community with mean value of 2.22. Before, during or after disaster, farmers keep thinking and become worried about their crops, livestock, assets, farm equipments and facilities and others. The loss of precious lives affect their emotions which indirectly affect food security. Internal or external pain further impact on overall agriculture sector. Farmers also lose their confidence about sowing of next crops, making good decisions and continue agriculture as a profession. The consequences could lead to food insecurity and socio-economic stability. Farmers can also shift to other professions or even may abandon this sector. However, still more work is required to deeply assess impact of natural disasters on health, emotions and psychology of farmers around the globe as this is an important issue from the current and future perspective.

Farm infrastructure is an important area where

farmers invest to get good harvest. However, natural disasters had also ruined these facilities in the research area (mean=2.19). Smashing of farm infrastructure may increase in the long run if not planned properly to manage the likely risks. The intensity of floods or abrupt land sliding damaged farm infrastructure which hampered agricultural activities. So, farming community perceived this impact as between high to medium level consequences of natural disasters.

Similarly, facilities, equipments and machinery were also got affected on account of natural disasters (mean=2.03). The equipments and machinery are also facilitate agricultural activities and their disturbance or damage either slow down or halt the agricultural activities. Although, the level of impact is between medium to high but still farmers cannot afford their damage. If these are adversely damaged, then it is another burdon on the shoulder of farming community and may take some time to repair or purchase new one. Therefore, farmers also witnessed impact in the five last years.

Fertilizer, farm store and labor also faced negative impacts but comparatively low with mean value of 1.89, 1.84 and 1.58 respectively. Less or unavailability of fertilizer at the time of need may further slow down or totally disturb the agricultural process. This could lead to less production and good quality output. The issue may also bring attention of middlemen to further exploit farming community and either sell on high price or create artificial shortage in the market. So, it seems that middlemen get advantage of these issues due to climate changes and ultimately, farmers are being badly affected. Farm store were also affected due to natural disasters.

The existing impact level were low which could be caused by different reasons. The first reason might be frequency of natural disasters and prior experience. Thus, timely information of frequent floods or likelihood of land sliding influenced farmers to build farm store on comparatively higher altitude. Another reason could be the intensity of floods during the last 5 years which may increase in the future on account of sudden climate changes. Another reason could be advisory services provided by agriculture extension staff to raise the level of farm store or timely prevent from occurrence of catastrophes. Importantly, the local wisdom or knowledge being transfered from generation to generation could also saved the farm store to get damage. The layout and particular location to built farm store on the basis of local wisdom might prevented some of the farmers from being destroyed.

Labor were another important aspect which faced impacts of natural disasters. Although, the level

The level of impact of natural disasters on farms and farmers in Malaysia over the past 5 years, survey conducted in 2015–2016

| No. | Impact | Level (Percentage) | | | Mean | SD |
|---------------------|-------------------------------------|--------------------|--------|------|--------------|-------|
| | | Level | Medium | High | | |
| 1. | Farm production | 9.2 | 24.4 | 66.4 | 2.57 | 0.655 |
| 2. | Irrigation and drainage | 18.9 | 34.7 | 46.4 | 2.28 | 0.761 |
| 3. | Emotion and Psychology | 8.9 | 60.0 | 31.1 | 2.22 | 0.593 |
| 4. | Farm infrastructure | 19.2 | 42.2 | 38.6 | 2.19 | 0.736 |
| 5. | Facilities, equipment and machinery | 26.4 | 44.4 | 29.2 | 2.03 | 0.746 |
| 6. | Fertilizer | 29.2 | 52.5 | 18.3 | 1.89 | 0.682 |
| 7. | Farm store | 32.5 | 50.8 | 16.7 | 1.84 | 0.684 |
| 8. | Labor | 54.4 | 33.6 | 11.9 | 1.58 | 0.696 |
| Overall Mean | | | | | 2.075 | 0.694 |

was low but may escalate in the coming times. The reason could be availability of agriculture labor even in hard times. Indeed, labor is easily available on account of daily wages and comparatively good income as compared to neighbouring countries so, this point could facilitated different rural areas to tackle the natural disasters. However, the rate of labor or their daily wages usually increase in the time of heavy floods and land sliding which could affect finance of farmers. Thus, there is a need to formulate advance strategies by public, private and other development organizations to facilitate the farmers and decrease labor shortage or curb the labor wages particularly at the time of natural disasters. Additionally, it can be concluded that farmers experienced both physical and psychological impacts on their farms and internal health (emotions and psychology). Finally, the overall level of impact of natural disasters on the basis of total average mean (2.075) were medium in the current scenario but this level may rise in the long run.

According to Baqutayan et al. [5], the big lesson of adverse impacts on farm infrastructure were from the big flood which occurred in east coast of Malaysia and adversely affected total farm production and physical facilities at farms. Additionally, Shaffril et al. [10] cautioned that climate change is not for the current time but it is the future dilemma as well which affect socio-economic fabric, human lives and health of the inhabitants of Malaysia. Moreover, Lindell [7] highlighted that natural disasters leave not only physical impacts but also social as well. Shaffril et al. [10], Austin and Baharuddin [2] indicated that climate vari-

ations would not only affect socio economic conditions, lives, or health in the present time but also keep affecting in the future too. Importantly, the negative impacts on the farmers specially resource poor farmers may be less frequent so, these should be observed closely [3].

Conclusion and Recommendations

All in all, the findings demonstrated that level of impact of natural disasters was high on farm production, irrigation, drainage, and emotion and psychology of farmers. Therefore, it is recommended that different stakeholders, particularly extension service providers, should assist farming community to manage the risks properly in order to avoid loss of production and farm infrastructure. Additionally, continuous mentoring of farmers is also required to avoid psychological and health related issues for better future of the country. For this purpose, special trainings programmes may be initiated by public and private sector to tackle psychological problems of farmers. In this way, impact level of natural disasters may be minimized and food security can be ensured at the national level.

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