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Climate Change Adaptation Strategies of Selected Smallholder Upland Farmers in Southeast Asia: Philippines and Indonesia

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ABSTRACT: Research was undertaken to assess the awareness of selected smallholder farmers on climate change issues, its effects on their agricultural production, and how they cope and/or adapt to climate change impacts. This article confirms that climate change impacts are already being observed and experienced by smallholder upland farmers in Indonesia and the Philippines. Farmers in the Philippines have observed stronger and more frequent rainfall and typhoons, while high temperatures have been prevailing in the upland areas of Indonesia. Among the observed effects include a higher incidence of pests and diseases, low crop productivity/yield, stunted growth, delays in fruiting and harvesting and a declining quality in the produce. The incidence of pests and diseases, including the growth of noxious weeds has also caused increase in labour costs. These circumstances have led to lower farm income. Results revealed that farmers make use of their local knowledge in addressing the effects of climate change. These include changing of their crops that would suit the changing rainfall pattern, integrating more crops to maximize the production, rejuvenation of trees, enrichment of crops, practice of agroforestry and rituals. Few farmers opted to get engaged with off-farm and non-farm activities. The results also point out the need to capacitate local institutions so that they could effectively communicate or disseminate information about the different climate change adaptation strategies that are appropriate in the farming communities within their respective areas, and strengthen the local knowledge of the upland farmers in adapting to the impacts of climate change.

KEYWORDS: *agroforestry, climate change, adaptation strategies, impacts*

The Research

This research was undertaken to assess the understanding and awareness of agroforestry practitioners and upland farmers on the issue of climate change and its impacts in agricultural development; identify indicators and evidence of climate change based on farmers' experiences and observations; analyse the different mechanisms and strategies that are being employed by upland farmers in coping with the impacts of climate change; and formulate recommendations for national and local development organizations for the adoption of appropriate climate change mitigation and adaptation strategies.

The research covered 56 smallholder respondents representing three major islands (Luzon, Visayas and Mindanao) in the Philippines; and upland farmers in the Forest Park, Wan Abdur Rahman Forest Park, Register 22 Way Waya, and People's Forest in Lampung Province in Indonesia.

Results

Climate Change Observed by the Smallholder Farmers

Upland farmers have already been experiencing climate change (Visco et al., 2011). All farmers noted considerable changes in climate compared with prevailing climate of the past. They recalled that, in the past, they could accurately plan their agricultural

production because of predictable rainfall patterns. But 43% of the respondents have observed changing climatic patterns in recent years, particularly since 2000. Specifically, 39% observed that heat is more intense, while 36% mentioned strong and frequent typhoons especially in year 2010 and 2011 (Figure 1). Specifically, in Northern Mindanao area and Eastern Visayas, the classified Type IV climate should result in an even distribution of rains throughout the year. However, farmers perceived longer rainy seasons to the extent that heavy rains are still observed during the summer season. This was also the claim of farmers in Northern and Southern Luzon.

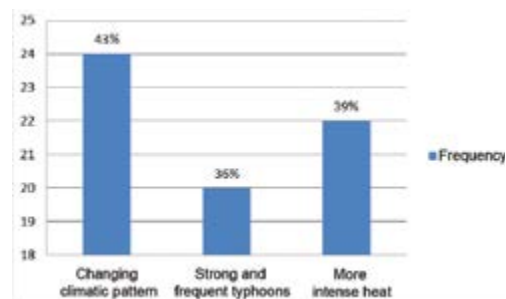


Figure 1. Indications of climate change as observed by the respondent-farmers in the Philippines

In Indonesia, on the other hand, 79% of the respondents considered the change in temperature as an indication of climate change (Wulandari et al., 2011). At present, the climate is much hotter compared to the

HIGHLIGHTS

- » Climate change is already being experienced by smallholder upland farmers in Indonesia and the Philippines, as evident by the changing and abnormal rainfall and temperature patterns.
- » Agricultural crop production has been greatly affected by climate change. Major effects include higher incidence of pests and diseases, low crop productivity/yield, stunted growth, low farm income, delays in fruiting and harvesting, declining quality of produce. The incidence of pests and diseases, including the growth of noxious weeds, has also resulted in increased labour costs.
- » Smallholder farmers utilize local knowledge to cope with/adapt to the impacts of climate change. These include changes in cropping patterns, change of crop, crop diversification, agroforestry practices, among others.
- » 70% and 100% of respondents in Indonesia and the Philippines, respectively, believed that agroforestry is a key strategy in climate change adaptation because of the diversity of direct and indirect benefits from the system, and the diversity of crop products. The loss of one crop can be compensated by another crop, particularly woody perennials.

past. Also, in the past, they could easily predict rainy and summer seasons, but now, fluctuating climatic patterns are observed.

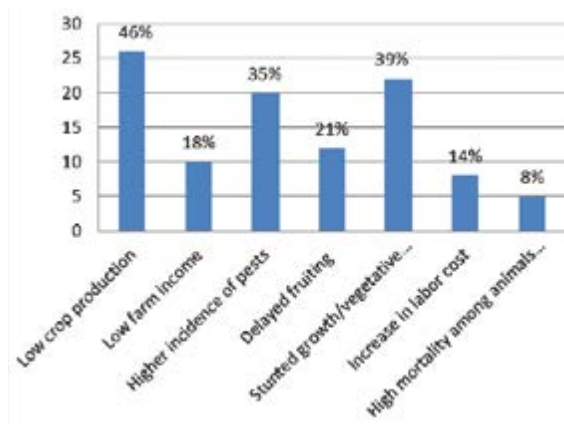


Figure 2. Observed effects of climate change in agricultural production of respondent-farmers in the Philippines

Observed Impacts of Climate Change in Agricultural Crop Production

Climatic changes have affected the agricultural production of respondent-farmers, simply because agriculture is influenced largely by rainfall and temperature. Visco et al. (2011) noted that generally, there has been a decline in the crop production of the respondents in the Philippines. Figure 2 shows that the decline in crop production is attributed to higher incidence of pests and diseases (35%), stunted growth (39%), and increased labour costs (14%). In addition, delayed fruiting (21%) and livestock mortality (8%) were also observed. In Indonesia, on the other hand, among the effects of climate change in agricultural crop production include delays in crop harvesting (82%), declining crop yields (77%), declining quality of produce (66%); and increasing incidences of pests and diseases (51%) (Wulandari et al., 2011).

Climate Change Adaptation Strategies of Small-holder Farmers

Results revealed that farmers make use of their local knowledge in addressing the effects of climate change to their agricultural production in both countries (Visco et al., 2011; Wulandari et al., 2011). Most of them mentioned changing their crops to suit the changing rainfall patterns, integrating more crops to maximize production, and a few practice rituals to prevent crops from pest infestation, while most of the respondents would not only plant the crops, but also engage in off-farm and/or non-farm

activities, leaving their farms uncropped (Figure 3). Perhaps the lack of resources and motivation to address the impacts of climate change has resulted in the engagement in off-farm and non-farm activities.

Meanwhile, in Indonesia, climate change adaptation strategies employed by the respondents include rejuvenation of trees, enrichment of crop species using local knowledge, textbook studying, or radio broadcasts. These strategies, according to 70% of the respondents, were effective in addressing the impacts on fruit crops, crop yield, water management and soil conditions (Wulandari et al., 2011). However, these did not address the problem of increased pest and disease incidences. About 74% of the respondents believed that agroforestry could be a best alternative land-use management system that could address the impacts of climate change.

Institutional Support for Climate Change Adaptation

The results also suggest a lack of information dissemination or communications from local development organizations on relevant climate change issues and strategies for climate change adaptation that could be employed by the farmers in the study sites in the Philippines (Figure 4).

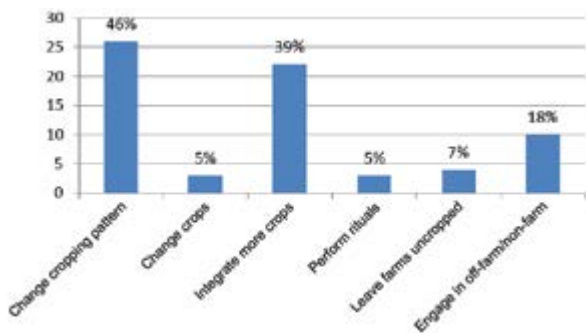
Meanwhile, in Indonesia, 89% of the respondents noted that the absence of assistance or programmes to mitigate or adapt to the impacts of climate change, particularly in the farming communities. Meanwhile, 11% of the respondents mentioned that the Forestry Sub-department had provided information about climate change, but this did not extend to mitigation and adaptation strategies. Thus, farmers believe that proper information dissemination and strengthening of community organizations are necessary to enhance their capacities to adapt to the impacts of climate change.

It is apparent, therefore, that local government organizations need to be equipped with the knowledge and skills pertaining to climate change and options for mitigation and adaptation, so these could be transferred to upland farmers within their area.

Conclusion

Climate change is being experienced by upland farmers, and observations include higher incidences of pests and diseases, low crop productivity/yield, increasing labour costs, low farm income, and delays in fruiting and harvesting. Results also confirm earlier research highlighting the role of local (traditional) knowledge of the smallholder farmers in climate change adaptation.

Figure 3. Climate change adaptation strategies of smallholder farmers in the Philippines

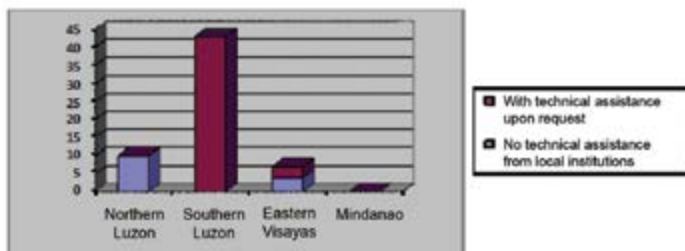


These practices are employed because of their ingenuity and lacking technical assistance from external organizations. Finally, the results suggest the need to capacitate local institutions for effective communication and dissemination of information on appropriate adaptation strategies for these farming communities, and strengthen the local knowledge of upland farmers in adapting to the impacts of climate change.

References

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Figure 4. Availability of technical assistance at the local level among the study sites in the Philippines



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PROJECT TITLE

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PROJECT LEADER

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