

Assessing Rice Farmer's Use of Seasonal Weather Forecast Data to Cope with Climate Variability in Central Highland of Vietnam

Author Nguyen Thi Chung
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Abstract

Nam Dong is a poor mountain district that belongs to ThuaThien Hue province, where 90% of local habitants are ethnic groups. Paddy rice is not only traditional production of population, but is also a major food crop for contributing food security of this district. Faced with increasing weather variability, the traditional farming calendar, existing local knowledge and experiences on predicting weather become less reliable to rice farmers. As a result, farmers, particularly poor farmers in highland area, who own mainly rain-fed farming land, may have higher risks of failure in agricultural production in general and rice production in particular. In this circumstance, the support from seasonal weather forecasts plays a significant role for farmers in terms of making related decisions to adapt with complicated weather conditions which have change trend in Nam Dong district, ThuaThien Hue province, Vietnam. Therefore, this study aims to find out how weather variability impacts rice production; how farmers use the seasonal weather forecasts in their rice production decisions to cope with weather variability, and which factors influence farmer's seasonal weather forecasts use in rice production decisions.

Data was collected by using participatory rural approach (PRA), and doing questionnaire survey with 180 rice households. To determine the effect of weather variability on rice production, ordinary least square model was applied. Besides, theory planned behavior and structural equation model analysis were used to find out factors which influence farmer's seasonal weather forecasts use in rice production decisions.

The results from ordinary least square model show that seasonal average rainfall, average highest temperatures, and average lowest temperatures had significant effect on rice yield. While, it was found that the seasonal rainfall factor had positive relationship with rice yield in both seasons, the seasonal maximum temperatures affected adversely on rice yield in two seasons. In addition, rice yield in the summer-autumn season did not relate to seasonal minimum temperatures, but this weather variable had positive impact on winter-spring rice yield at statistical significant level. Moreover, participants in the focus group forum reported that they believed many weather events were irregular and unpredictable as locals experienced. Droughts tend to occur more frequently, and this had negative impact on rice production.

The results from PRA tools indicated that the seasonal weather forecasts particularly related to drought, flood, and storm events were the most concerned on the decisions of rice production activities. The influence and use of seasonal weather forecasts in specific rice production decisions were still low. Planting date selection, harvesting date selection, and pesticide

application decision were three (3) main keys of rice production decision that had the influence of SWFs. Moreover, it was noted that spouses, children, relatives, neighbors, local leader, woman union, extension officers, television, and radio were key sources of SWFs to farmers.

Theory of planned behavior by applying structural equation model analysis proved that farmer's attitude, social subjective norms, and perceived controls had positive and significant relationship to farmer's SWFs use in rice production decisions. Whereas farmer's attitude was determined as the greatest direct effect on farmer's use of SWFs and perceived controls, followed by second factor of influence, while subjective norms were the least effect on farmer use of SWFs in rice production decisions making.

The research results may provide useful data to assist local governments in rural socioeconomic development plans to minimize the impacts of adverse weather conditions. It also would help meteorological stations, agricultural and extension units to improve their methods of communication about weather variability to farmer and to have proper adjustments in terms of communication of weather information to farmers.