

## 論文の内容の要旨

論文題目      Analysis of Adaptation to Climate Change  
                    -Perception and Behavior of Apple Farmers in Cheongsong, Korea-  
                    (気候変動に対応した適応策の分析  
                    -韓国青松郡における林檎農家の認識と行動-)

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Climate change poses an enormous threat to the environment, economic and social components of society and it is particularly a vital issue for a sector such as agriculture which depends fundamentally on the climate vulnerable resources. To respond adequately to climate change, agricultural sector requires operational adaptation measures within the community. International, regional and national communities, undertake rigorous researches to find out the solutions to confront climate risks. However, the livelihoods of farmers and rural communities are still facing the great threats from changing climate. It is because most of the introduced adaptation policies fail to address the factors motivating private adaptation behaviors. Climate change adaptation policies without considering farmers' perceptions on climate change and adaptation practices, private adaptation strategies are unlikely to be effective. This dissertation, therefore, investigates the perceptions and behaviors of apple farmers in Cheongsong County, a major apple-producing region of Korea, in response to climate change.

This dissertation aims to examine and analyze local knowledge and perception on consequences of climate variability and change. Therefore, it critically studies how adaptation is governed at micro-level. To meet such objectives, this study based on an integrated theory that has a prominent theory in Protection Motivation Theory (PMT). Integrating the theory which posits that individual action of adaptation is based on social psychological and behavioral economic theories, a Model of Private Proactive Adaptation to Climate Change (MPPACC) explains individual's intention of adaptive behavior that needs to be understood from socio-cognitive factors: climate change risk appraisal and adaptation assessment. In addition to the two most important factors, some cognitive factors such as maladaptation and trust of government are found to have significant role motivating individual to adapt in response to climate variability and change. This dissertation, based on the socio-cognitive models, has four primary objectives that are: 1) to investigate farmers' awareness and relative issues associated with climate variability and change; 2) to analyze farmers' perception of climate change risk and investigate the influencing factors; 3) to analyze farmers' perception on adaptation efficacy and investigate the influencing factors; 4) and to examine socio-cognitive factors determining farmers' intention to adaptation behaviors. Aiming for such objectives, this dissertation examined the importance of integrating farmers' perceptions into to local adaptation policies to enhance the adaptive capacity of local people.

To analyze the climate change risk and adaptation perceptions and behaviors of apple farmers in Cheongsong County, this dissertation applied mixed methods including, extensive literature review, field observation, farm household survey, and focus group discussions and in-depth individual interviews with local farmers, agricultural government officers, and experts. A structured questionnaire survey of 170 randomly chosen apple farm households in Cheongsong County equipped the primary data on farmers' characteristics, awareness, perceptions, and behaviors. The results of the agricultural household survey together with field observation, focus group discussions and interviews amplified understanding of the process of the farmers' climate change adaptation practices.

The local farmers' were found to have own ways to detect trends of local climate variability and change. A comparative analysis was applied to compare and contrast between the farmers' assessments and scientific findings on climate change. The analysis found that in general, local knowledge on climate change, impacts, and attributes, in fact, were by scientific findings. The local knowledge was found to be shaped by farmers' experiences with climate variability and change. This finding presents policy implication for the local and regional adaptation policy. To develop appropriate strategies to encounter local climate change, and increase resilience to climate risks, it is necessary to incorporate the local knowledge with scientific data and the integration of the knowledge could deliver a more accurate understanding of practical issues that farmers' faces associated with local climate change.

Farmers' climate risk perception was measured by perceived risk probability and severity of apple production, income, assets, physical health, natural resources, social network, and mental health. Linear regressions emphasized that some demographic and socioeconomic factors, climate change awareness, fear of the future climate risks, climate risk experiences, and information influence the farmers' perception of climate risks. The results pose some policy implications that in designing and disseminating adaptation policies, farmers' risk perception should be considered as an important factor in the adaptive process. Moreover, the quality and sources of information, communicating climate risk issues through local context should be deemed to exploit the promotion of private adaptation policies in rural areas.

Farmer's perception of adaptation efficacy was investigated through examining the factors influencing the farmers' evaluation of adaptation measure, self-capacity and adaptation costs. The factors including some farm household characteristics and information were found to affect the farmers' perceived adaptation efficacy. The result suggests that improving designing of contents and source of information can enhance farmers' perceptions of adaptation effectiveness. Moreover, some socioeconomic factors including crop insurance were found to be a crucial factor for farmers' perceptions. More localized and specified designing and careful management of the system could enhance the farmers' credibility and perception on adaptation efficacy.

This dissertation, using logistic regressions, found that the farmers' intentions to adaptive behaviors are affected by socio-cognitive factors such as climate risk perception and perceived adaptation efficacy. The findings imply that the cognitive factors significantly influence the farmers' intention of some private adaptation behaviors. Therefore to enhance the farmers' adaptation capacity, relative policies should consider developing cognitive indicators to evaluate the farmers' adaptive responses. Further, the local context information and the cultural representative figures can have a significant role in disseminating adaptation information. To promote farmers climate resilience sustainably, it also suggests that the local climate change policy to balance adaptation and mitigation and create international networks to have exchange training programs so as to farmers themselves can share and learn from the experiences.

In sum, this dissertation provides an advanced understanding of the process of farmers' adaptation behavior on socio-cognitive aspects. The findings determine that climate change and rural development research and policies must consider integrating the cognitive factors. Integrating cognitive indicators into farmers' adaptation capacity may enhance long-term climate resilience of agriculture and rural communities.