16:45 Changing rainfall pattern in Northeast Thailand and implications for cropping systems adaptation

Lacombe Guillaume[1], Polthanee Anan [2], Jintrawet Attachai [3], Trébuil Guy[4]

[1]*International Water Management Institute (IWMI), Southeast Asia Regional Office, PO Box 4199, Vientiane, Lao PDR*
[2]*Department of Plant Science & Agricultural Resources, Faculty of Agriculture, Khon Kaen University, Khon Kaen 40002, Thailand*
[3]*Center for Agriculture & Resources Systems Research, Faculty of Agriculture, Chiang Mai University, 50000 Chiang Mai, Thailand*
[4]*Centre de coopération Internationale en Recherche Agronomique pour de Développement (CIRAD), UMR Innovation, 34398 Montpellier Cedex 5, France*

In Northeast Thailand, about 80% of the 20 million inhabitants are engaged in rainfed agriculture. Climate vagaries combined with coarse-textured sandy and unevenly distributed saline soils explain low agriculture yields and the endemic relative poverty of the population. We conducted an in-depth analysis of change in the rainfall pattern using daily records (1953-2010) from 18 gauging stations scattered across Northeast Thailand. Based on an intimate knowledge of the local farming systems, particularly their strategies to deal with climate variability and their evolution during the past decades, we analyse and discuss how the cropping systems can adapt to the detected rainfall changes. We used the Mann–Kendall trend detection test, modified to account for serial correlation at each individual station, and the regional average Kendall's statistic designed for the detection of regional trends across the entire studied area. On-farm surveys carried out during the past two decades in both the upper and lower parts of Northeast Thailand provide a detailed understanding of the functioning of the agricultural production systems and their diversity. The analysis reveals very limited changes in rainfall frequency, intensity and extremes during the humid monsoon and therefore little change in the existing climatic constraints to agricultural production (early dry spells in the wet season and risk of floods at its peak in September). But we found a significant regional trend toward a wetter dry season that could offer new limited opportunities for agricultural production. The paper will discuss the implications of these findings and compare them with recently published research results. Differences in statistical significance between local and regional rainfall trends are also interpreted. If these trends extend, households would not face many difficulties because of their renowned adaptive capacity built over centuries of facing highly variable rainfall patterns, and due to the diversity of their resilient farming systems.