A Tool Supporting Water Management Preparedness for Drought

Abstract

Drought is a natural disaster that occurs in Thailand almost every year. Most droughts are caused by insufficient rainfall or below-average rainfall during the rainy season, coupled with dry spells in June and July. The areas most affected by drought include the central of northeastern region in Thailand, as it is outside the influence of the southwest monsoon that is important factors for the rain that will occur. This situation significantly impacts agriculture. Moreover, the current issues of climate change have exacerbated the severity of drought compared to the past. To address or mitigate the effects of drought, it is essential to use a tool supporting water management preparedness for drought. These tools must ensure that the available water supply in an area meets the demand during critical periods, minimizing the impact even in years with very low rainfall. A water balance model has been employed to assess the adequacy of water resources in water demand. Statistical methods are also used to evaluate areas at risk of agricultural water shortages during the dry season. These assessments use indicators such as the number of days crops can withstand water scarcity, categorizing risk levels as high, moderate, low, or no risk. To address cases of low water availability, data from 2019 was selected for analysis because it was a year with relatively low annual average rainfall nationwide, approximately 1,218 millimeters (compared to Thailand's 30-year average of 1,500 millimeters). Additionally, that year experienced dry spells during the rainy season (usually occurring from June to July)

From the assessment of areas at risk of agricultural water shortages during the dry season, a total of 889 sub-districts were identified as high-risk. These include 159 sub-districts in the Northern region, 383 sub-districts in the Northeastern region, 179 sub-districts in the Central region, 6 sub-districts in the Eastern region, 20 sub-districts in the Western region, and 142 sub-districts in the Southern region, as detailed in Table 1 and Figure 1.

Table 1 : Number of Sub-districts at Risk of Agricultural Water Shortages

Region	No Risk	Low Risk	Moderate-Risk	High Risk
Northern	7	140	525	159
Central	200	913	685	179
Northeastern	1	245	1,989	383
Eastern	130	252	90	6
Western	116	160	105	20
South	261	418	262	142
All	**715**	**2,128**	**3,656**	**889**

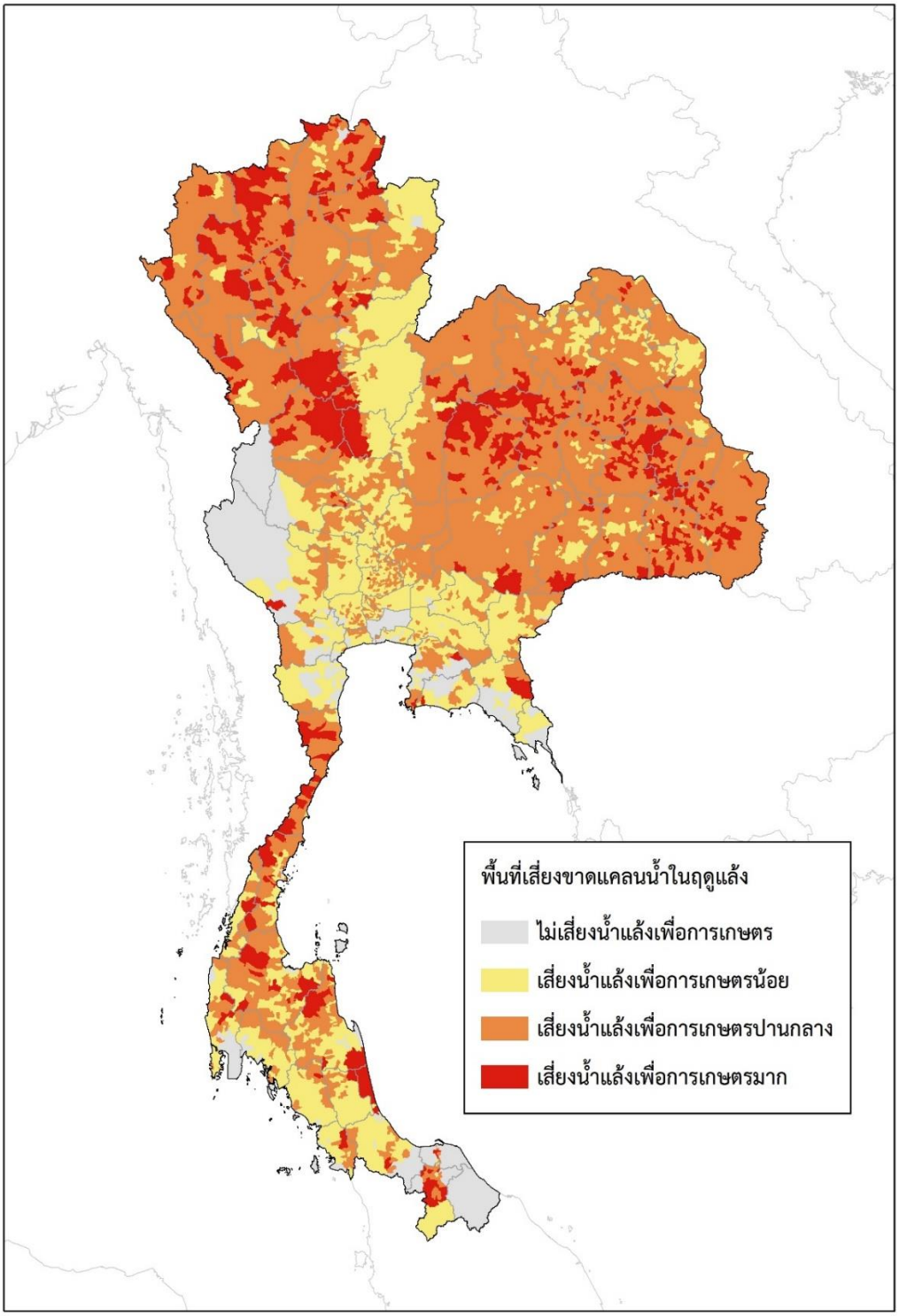

Figure 1: Areas at risk of agricultural water shortages

Almost all areas of the country, especially in the Northeastern Region, are at moderate to high risk of agricultural water shortages .This indicates that these areas may not have enough water resources to support the current type of agriculture. Therefore, there must be a plan to cope with possible water shortages in the future. For example, changing the types of crops grown, finding additional water sources, and changing water usage behavior in agriculture (reusing water, etc.) in order to adapt and cope with the drought that may occur appropriately.