

Contents lists available at [ScienceDirect](#)

## Kasetsart Journal of Social Sciences

journal homepage: <http://www.elsevier.com/locate/kjss>

# Climatic considerations which support the choice between natural rubber and oil palm in Nakhon Si Thammarat, southern Thailand

Rattana Unjan<sup>\*</sup>, Ayut Nissapa, Rawee Chiarawipa

Faculty of Natural Resources, Prince of Songkla University, Songkhla 90112, Thailand

## ARTICLE INFO

## Article history:

Received 15 February 2016  
 Received in revised form 11 July 2016  
 Accepted 15 July 2016  
 Available online xxx

## Keywords:

choice,  
 climatic variables,  
 natural rubber,  
 oil palm,  
 southern Thailand

## ABSTRACT

Four climatic variables—rainfall, number of rainy days, relative humidity, and temperature—were studied to observe the characteristics and probable occurrences outside the required bounds for the optimal growth of oil palm and natural rubber. These two economic crops have become increasingly popular among farmers in Nakhon Si Thammarat province, southern Thailand. Monthly and annual data during 1981–2011 were analyzed using appropriate time-series techniques. The out-of-bound probabilities were calculated using the counting method. Only the rainfall showed a significant and increasing trend while the trends in the other variables were not significant. All studied variables showed seasonal fluctuation and cyclical movements. No significant irregularities appeared in the data. The probable occurrences of these climatic variables are crucial in determining the regular and sufficient levels of rainfall required for oil palm and natural rubber. Climate risks were less for growing natural rubber. This study concluded that natural rubber was a more climatically suitable crop for Nakhon Si Thammarat province, if only the four stated climatic variables were considered.

© 2017 Kasetsart University. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Introduction

The most frequently asked question in Nakhon Si Thammarat province in southern Thailand and perhaps throughout the country is which economic crop is more viable to plant, natural rubber (*Hevea brasiliensis* L.) or oil palm (*Elaeis guineensis* Jacq.). One of the factors in crop production is climatic conditions which include, *inter alia* rainfall, temperature, relative humidity, wet/dry period, precipitation, and day length (Eksomtramage, 2011; Rubber Research Institute of Thailand, 2010).

The availability and quality of water is the most important ingredient crops require to grow, especially in areas where irrigation is limited or absent. Therefore, crop production relies primarily on rainfall. Moreover, the amount of rainfall and water retention in the soil determines yields and consequently farmers' incomes. However, climate is variable and uncertain—in some years there is a water surplus while in other years there is a water shortage and drought. These variations affect the crop's ability to grow and provide a sufficient yield (Srikul, Meedej, Korawis, Nithedpattarapong, & Klodpeng, 2000).

Kang, Khan, and Ma (2009) indicated that crop production could increase in areas where water sources were available such as irrigated areas. In addition, climatic variables, such as temperature and humidity were reported to be the important determinants of rice and potato yields in Nepal (Joshi, Maharjan, & Piya, 2011). Rice yields in

<sup>\*</sup> Corresponding author.

E-mail address: [unjanr@yahoo.com](mailto:unjanr@yahoo.com) (R. Unjan).

Peer review under responsibility of Kasetsart University.

<http://dx.doi.org/10.1016/j.kjss.2016.07.006>

2452-3151/© 2017 Kasetsart University. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Please cite this article in press as: Unjan, R., et al., Climatic considerations which support the choice between natural rubber and oil palm in Nakhon Si Thammarat, southern Thailand, Kasetsart Journal of Social Sciences (2017), <http://dx.doi.org/10.1016/j.kjss.2016.07.006>

Bangladesh were also influenced by increased temperature and rainfall (Sarker, Alam, & Gow, 2012) and by rainfall, sunshine and humidity (Amin, Zhang, & Yang, 2015; Chowdhury & Khan, 2015). The rice yields increased within optimal ranges of these climatic variables.

The climate variables associated with rainfall are complex. There are micro- and macroclimatic variables that need to be considered. The complexity of these variables and their relationships are understood and the variables used to determine the amount of rain and its distribution and frequency are numerous and their occurrences are a matter of probability. Atmospheric humidity (involving moisture and temperature) is one of these variables (Kamnalrut et al., 2000).

Natural rubber and oil palm are two major economic crops grown widely in southern Thailand. They are considered compatible with local soil types and climatic conditions and give reasonable yields and attractive monetary returns to the farmers. Past success stories have encouraged new investors to encroach into public lands, upland forest, mangroves, peat swamp forest, and other unsuitable lands in the hope of similar yields. These relatively new farming practices are often carried out under the assumption that rainfall will be available at the appropriate level required to produce the desired yields. However, there has been an increasing amount of evidence that suggests droughts and floods have directly hindered the normal growth of natural rubber and oil palm, resulting in

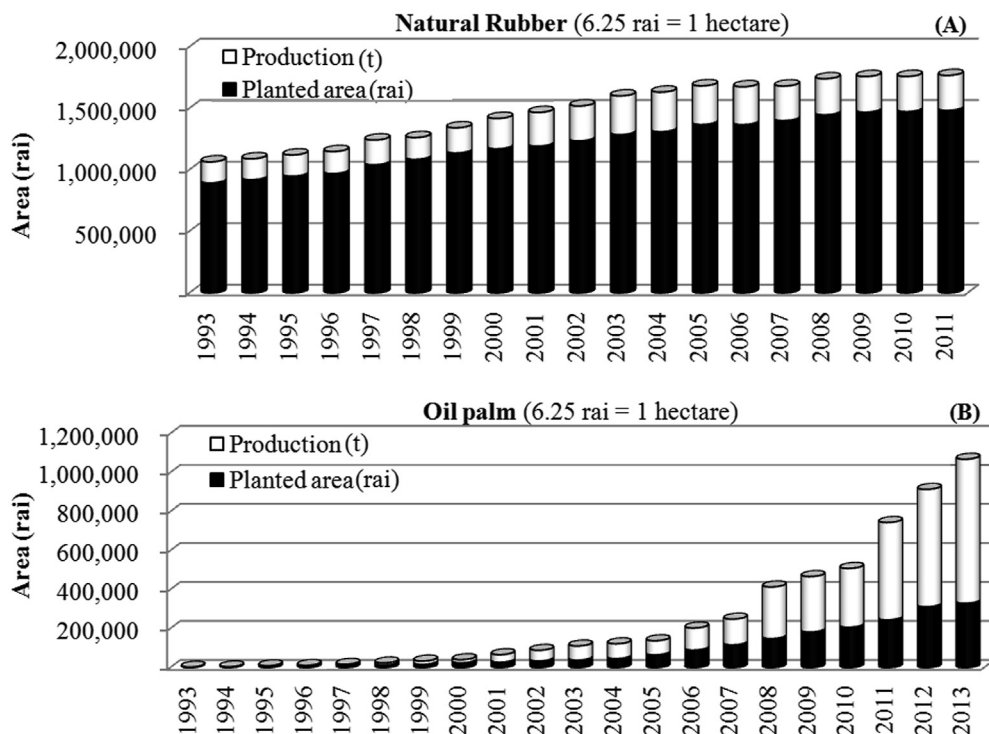
low yields and high mortality rates. The current study was undertaken in Nakhon Si Thammarat province on the east coast of southern Thailand. The two economic crops are popular choices for growing in and around the peat swamp areas. Thus, the objective of this study was to understand the patterns of the four climatic variables identified, and to determine the probabilities of exhibited risks against normal growth of natural rubber and oil palm in the study area.

## Literature Review

### Study Site

Nakhon Si Thammarat is a province situated on the east coast of southern Thailand and at 994,300 ha, it is the largest of all the southern provinces (Poonwong, 2007). The province's population was 1.5 million in 2014 making it the most populated southern province (Nakhon Si Thammarat Province Statistics, 2014).

There are currently 243,292 ha involving 131,000 households under natural rubber and oil palm production in Nakhon Si Thammarat province (Rubber Research Institute of Thailand, 2013). The natural rubber yield and productivity were 317,352 t and 1.8 t/ha/year, respectively, and 738,863 t and 18.3 t/ha/year, respectively, for oil palm. In 2013, the trend of planted area showed positive growth over the years for both crops as shown in Figure 1A and B.



**Figure 1** Trend in production and productivity of natural rubber and oil palm in Nakhon Si Thammarat province, southern Thailand during 1993–2011  
**Source:** Rubber Research Institute of Thailand (2010)

Download English Version:

<https://daneshyari.com/en/article/6844019>

Download Persian Version:

<https://daneshyari.com/article/6844019>

[Daneshyari.com](https://daneshyari.com)