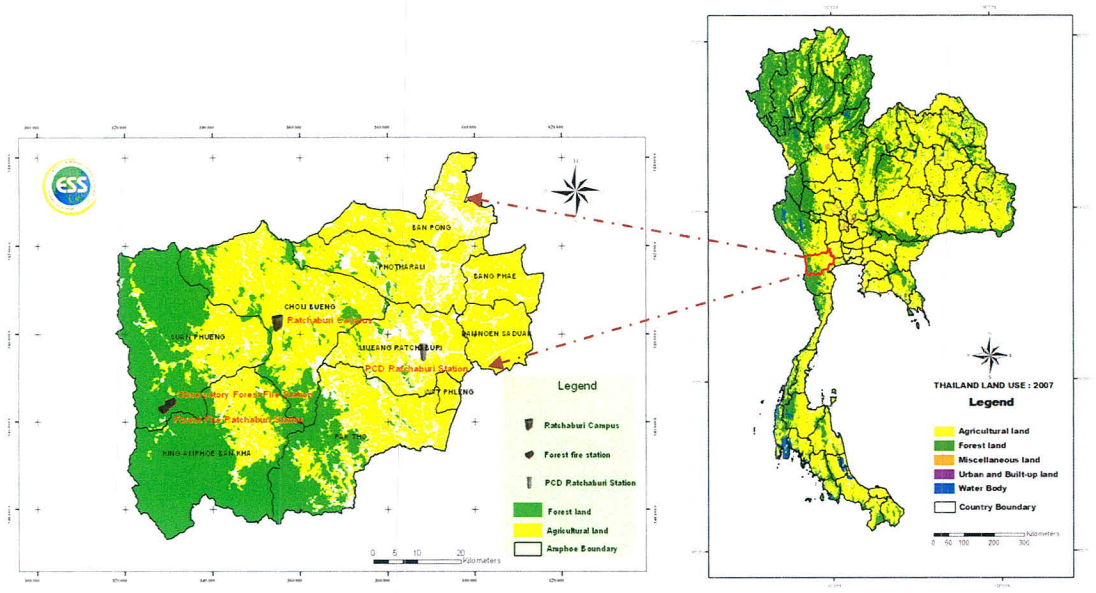
CHAPTER 2
STUDY AREA

2.1 Forest Land in Ratchaburi

Ratchaburi is one of the provinces located in western Thailand, approximately latitude 13°32′ - 13.54°N and longitude 99°49′ - 99.82°E. This area covered 5,196,462 km^2 (519,646.24 ha). The high mountain areas located on the western border with Myanmar at altitudes from 200 to 1,400 m in Suan Pueng district, Khing Amphoe Ban Kha and Park Tho district. These areas are very less of rainfall due to the southwest monsoon is block by Tanowsri Mountain.



(a) (b)

Source: (a) & (b) An Inventory of air pollutant and Greenhouse Gas Emission and Concentrations in Ratchaburi province, Thailand, ESS (Earth System Science), KMUTT (King Mongkut's University of Technology Thonburi).

Figure 2.1 Location of field experiments at Ratchaburi Forest Fire Control Station, Ratchaburi Province, Thailand

The forest type in Ratchaburi included of tropical rain forest, dry dipterocarp forest mixed, deciduous forest and bamboo forest. In year 2000, the preliminary forest land use assessment are tropical rain forest was 14,960 ha, DDF was 121,840 ha, MDF was 16,700 ha, and bamboo forest was 220 ha, respectively (www.forest.go.th). Both the DDF and MDF are the two major forest types in Ratchaburi Province (Table 2.1).

Table 2.1 Forest land in Ratchaburi Province

Forest type	Forest area	
	(rai)	(ha)
Tropical rain forest	93,500	14,960
Dry dipterocarp forest	761,500	121,840
Mixed deciduous forest	104,375	16,700
Bamboo forest	1,375	220
Other forest	-	-
Total	960,750	153,720

Source: www.forest.go.th

2.2 Ratchaburi's Topography and Climate

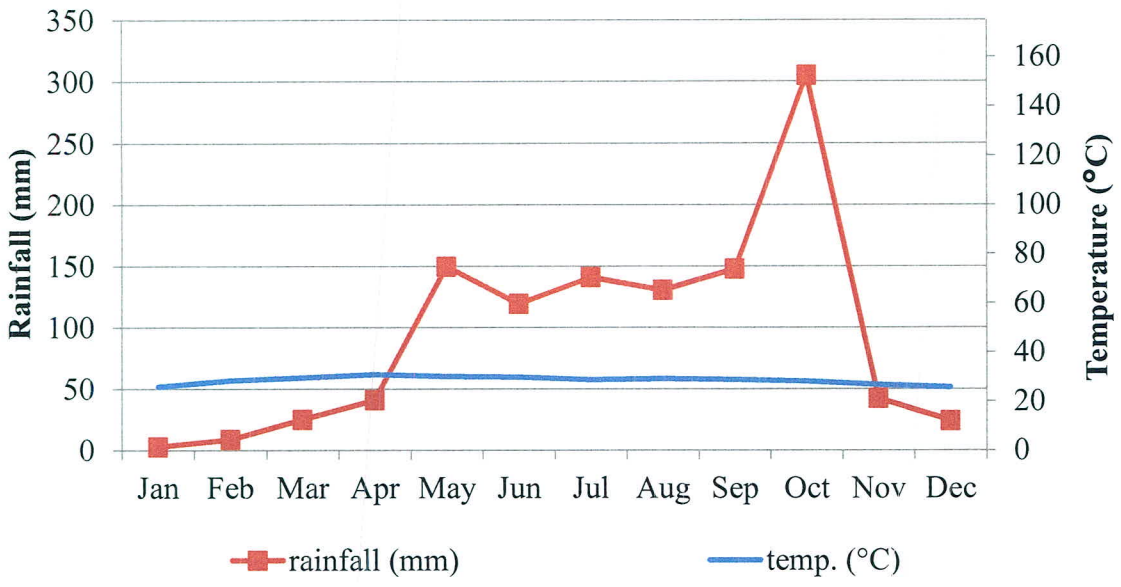


Figure 2.2 Average temperature and rainfall in Ratchaburi Province during 2005-2009

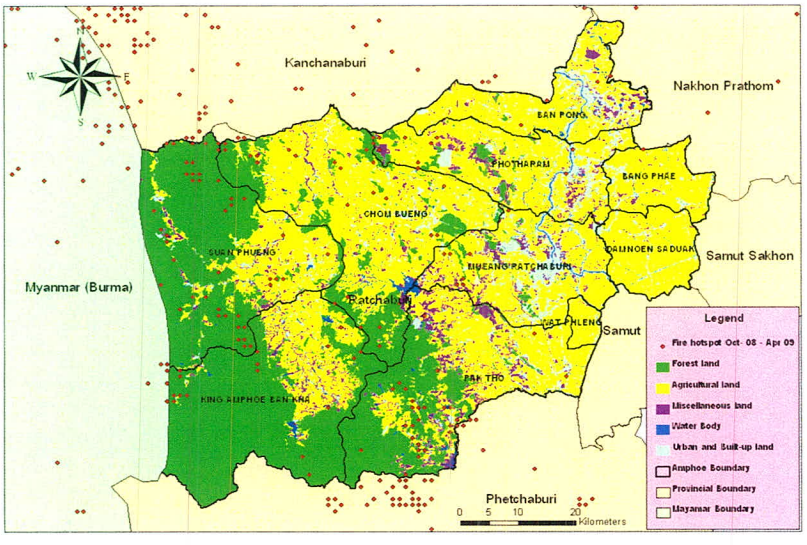
Tanaowasri range, a border of Thailand-Myanmar, is the source watershed to Pharchi River and through into the Mae Klong River. Rock and sand are main component soil structure in the site. The site selection has low level of rainfall due to it located in the rain shadow of Tanaowasri range. Most of rainy season occur in May until October and dry season usually occur in November to December and January to April (Figure 2.2). Tanaowasri range, a border of Thailand-Myanmar, is the source watershed to Phachi River and through into the Mae Klong River. Rock and sand are main component soil structure in the site. The site selection has low level of rainfall due to it located in the rain shadow of

Tanaowasri range. Most of rainfall and dry season usually occurs in October until November and in January to March, respectively.

In this province, the average total rainfall and mean temperature during the years 2005 to 2008, were 959-1,285 mm and 28°C, respectively (Ratchaburi meteorological station reported). The highest temperature in dry season especially in April, lies between 30.3-31.3°C. On the other hand, December was the coolest month with temperature range from 24.5-26.9°C. January corresponds to the driest month range with rainfall lesser than 6.5 mm rainfall, while October was the wettest month range of 117.6-441.5 mm rainfall (Figure 2.2).

2.3 Forest Fires in Ratchaburi

Forest fires in Ratchaburi Province annually occur in the dry season due to the peak month during January to March having highest fire hotspots (Figure 2.3). The surface fire will consumes biomass fuel such as litter, twig, grass, climber and herb. Causes of forest fire in Ratchaburi province consist of agricultural debris burning, incendiary fire, hunting, and illegal logging. The fire hot spots occurrence during 200-2009 was illustrated in Figure 2.3. The frequency of burning in Ratchaburi province occurs in the forest land was the highest in year 2010. In addition of the burned area in MDF are higher than 90% in 2010 (Table 2.2).



Source: An Inventory of air pollutant and Greenhouse Gas Emission and Concentrations in Ratchaburi province, Thailand, ESS (Earth System Science), KMUTT (King Mongkut's University of Technology Thonburi).

Figure 2.3 Accumulative fire hotspots occurrences in Ratchaburi Province in October to April during 2008-2009

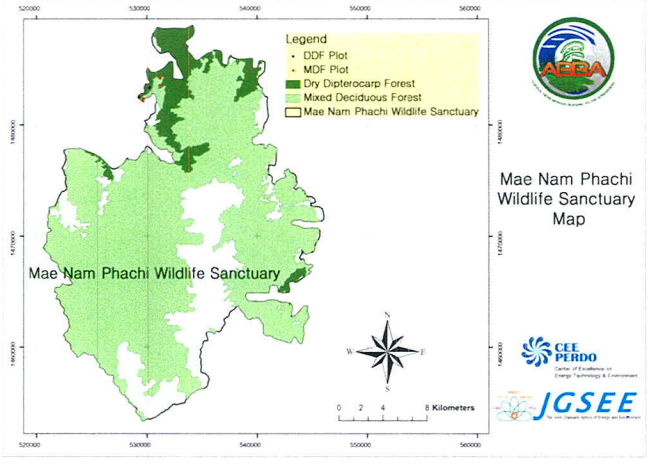
Table 2.2 Statistics of forest fires in DDF and MDF as reported from Ratchaburi Forest Fire Control Station during 2007-2010

Year	Frequency (number)	Area burned (ha)		
		DDF	MDF	Total
2007	93	0.80	19.36	20.16
2008	37	-	3.04	3.04
2009	454	15.2	21.44	36.64
2010	557	5.76	67.68	73.44

Source: data collected from Ratchaburi Forest Fire Control Station, Ratchaburi Province, Thailand.

2.4 Experiment Set-Up

The study site was set up in a natural mixed deciduous forest in Mae Nam Phachi Wildlife Sanctuary Ratchaburi Province (13°8′ N - 13°27′N latitude and 99°10′ E - 99°25′ E longitude), located in Baan Beung, Suan Pheung District, Ratchaburi province, about 210 km west of Bangkok, the capital of Thailand (Figure 2.4). It covers a total area of 489 km^2, and includes dry dipterocarp forest, mixed deciduous forest, tropical rain forest and pure stand bamboo forest. The altitude of the highest mountain peak areas located in the western part of the province, i.e. Suan Pueng District, Khing Amphoe Ban Kha, and Park Tho District, close to the border of the country with Myanmar. The altitude of the study area ranges from 200 to 1,400 m asl. It has been considered as "the rain shadow zone" since most of the rain is blocked by the Tanowasri Mountain Chain.



Source: An Inventory of air pollutant and Greenhouse Gas Emission and Concentrations in Ratchaburi Province, Thailand, ESS (Earth System Science), KMUTT (King Mongkut's University of Technology Thonburi).

Figure 2.4 Field experiment study areas at Mae Nam Phachi Wildlife Sanctuary Ratchaburi Province, Thailand