

References

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Appendix

Appendix A

STUDIED AREA

Om Koi District is located in the south of Chiang Mai Province located in the northern part of Thailand. The district covers the area of approximately 2,093.8 km^2 . The average land elevation is in relatively high altitude (more than 1000 m. above the sea level). The topography is mountainous covered mostly by forests. Geographically, it can be classified into 2 subareas: high mountain area covering 80% of total area and low mountain area. Most of these areas are designated for wildlife sanctuaries or national parks. The land use of the area can be divided as mixed forest (30%), abandoned delicious forest (28%), coniferous forest (27%) and vegetation area. There are rivers flowing through Om Koi District such as Tom river and Tuen river which are essential for water supply in Om Koi. The majority of people suffer mostly from natural disasters such as, flooding and poor agricultural harvesting in the summer period because of its geographic location and soil property.

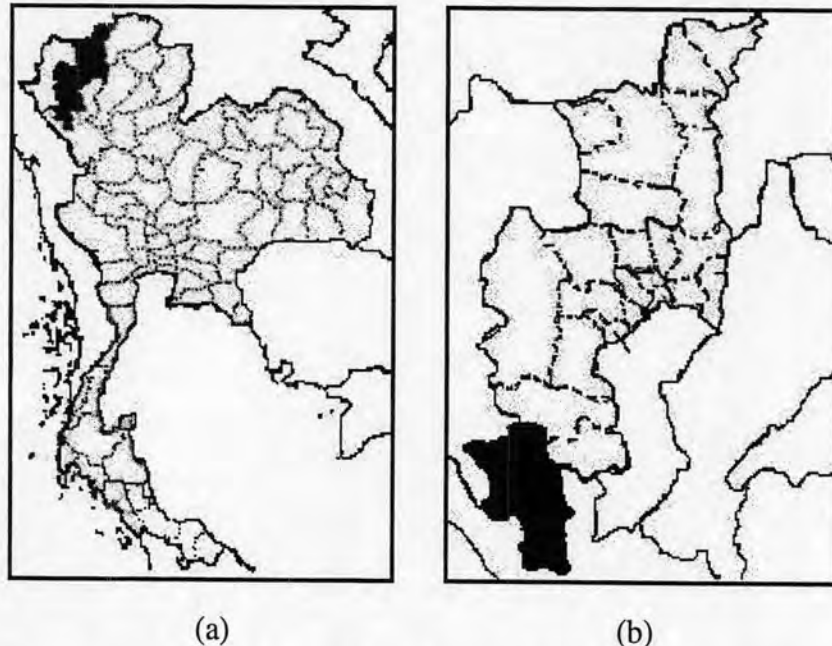


Figure A.1: (a) Location of Chiang Mai Province and (b) Location of Om Koi District.

Om Koi catchment area, used as a studied area in this work, is located in the upper part of a Mae Tuen river which is the small branch of Ping river. It covers approximately area of 503 square kilometers. Geographically, this area is bounded by the latitude 17°47'N to 18°2'N and longitude 98°12'E to 98°30'E. From the reports by Land Development Department, it is found that the 60 % of the total area is not suitable for cultivating plant because the soil is shallow with gravels mixing or sandy loam. In the studied area, hydrologic data obtained from the Royal Irrigation Department of Thailand. The hydrologic data was recorded at the P.64 station which is the only nearby station in the watershed. Ten-year records of hourly and three hourly data of rainfall and runoff were recorded between April 1996 and December 2005. The P.64 station for rainfall data is located at Ban Mea Tuen, Om Koi District. Rainfall data was measured in *mm/hr* by automatic rain gauge. The hourly rainfall was partially incomplete due to the failure of the automatic rain gauge. The P.64 for runoff data is located at Ban Laung, Om Koi District. The runoff data were recorded as water level in meters (*m*). Monthly rainfall and runoff data can be shown in the Table A.1 and A.2.

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	ANNUAL
1996	2.5	5.4	5.2	2.1	6.5	9.6	2.5	1.9	0.0	0.0	0.0	0.0	2.98
1997	1.8	2.9	1.6	4.4	5.8	5.5	2.6	0.3	0.0	0.0	0.0	0.0	2.08
1998	0.0	5.0	1.3	2	3.9	4.2	1.8	0.9	0.0	0.8	0.9	0.7	1.79
1999	4.5	7.7	3.2	2.4	****	6.5	6.7	1.5	0.2	0.0	1.5	0.8	3.18
2000	5.9	6.8	0.0	2.2	4.3	4.5	5.3	0.1	0.9	0.0	0.0	0.0	2.50
2001	0	5.5	2.0	4.0	3.5	5.0	4.1	1.3	0.6	0.0	0.4	0.3	2.23
2002	2.5	8.4	3.5	3.0	5.8	9.9	3.3	5.2	2.2	0.4	0.0	0.7	3.73
2003	3.19	3.9	4.1	5.6	3.3	6.5	0.0	0.0	0.0	0.6	0.0	0.0	2.27
2004	0.2	7.9	5.2	1.1	3.1	3.4	0.9	0.5	0.0	0.6	0.0	0.5	1.94
2005	2.7	6.2	2.7	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.24
Mean	2.33	5.96	2.88	3.02	4.03	5.50	2.72	1.16	0.39	0.23	0.28	0.30	2.39
Max	5.9	8.4	5.2	5.6	6.5	9.9	6.7	5.2	2.2	0.8	1.5	0.8	3.73
Min	0	2.9	0	1.1	0	0	0	0	0	0	0	0	1.24

Table A.1: Monthly rainfall data recorded at P.64 station. Source: Royal Irrigation Department of Thailand.

Note: **** represents that data was not recorded in August, 1999.

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	ANNUAL
1996	0.53	0.69	0.83	0.95	1.25	1.44	1.11	1	0.7	0.6	0.5	0.5	0.84
1997	0.47	0.42	0.49	0.94	1.33	1.15	1.03	0.75	0.6	0.5	0.4	0.4	0.71
1998	0.4	0.4	0.41	0.56	0.62	0.7	0.51	0.49	0.4	0.39	0.36	0.3	0.46
1999	0.49	0.95	0.8	0.83	1.41	1.11	1.21	0.99	0.66	0.6	0.48	0.42	0.83
2000	0.48	0.83	0.9	1.02	0.95	1.15	1.19	0.79	0.64	0.5	0.4	0.4	0.78
2001	0.32	0.43	0.42	0.75	0.90	0.69	0.76	0.62	0.47	0.40	0.37	0.31	0.54
2002	0.31	0.67	0.60	1.00	1.26	1.52	1.19	0.92	0.81	0.63	0.52	0.45	0.82
2003	0.43	0.40	0.60	0.90	0.71	0.77	0.72	0.52	0.44	0.40	0.33	0.27	0.54
2004	0.26	0.51	0.90	0.71	0.88	0.88	0.67	0.56	0.49	0.43	0.53	0.59	0.62
2005	0.57	0.51	0.54	0.84	1.02	1.24	0.80	0.80	0.58	0.52	0.46	0.42	0.69
Mean	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Max	0.57	0.95	0.93	1.02	1.41	1.52	1.21	1.00	0.81	0.63	0.53	0.59	0.83
Min	0.26	0.4	0.41	0.56	0.62	0.69	0.51	0.49	0.4	0.39	0.33	0.27	0.46

Table A.2: Monthly water level recorded at P.64 station. Source: Royal Irrigation Department of Thailand.

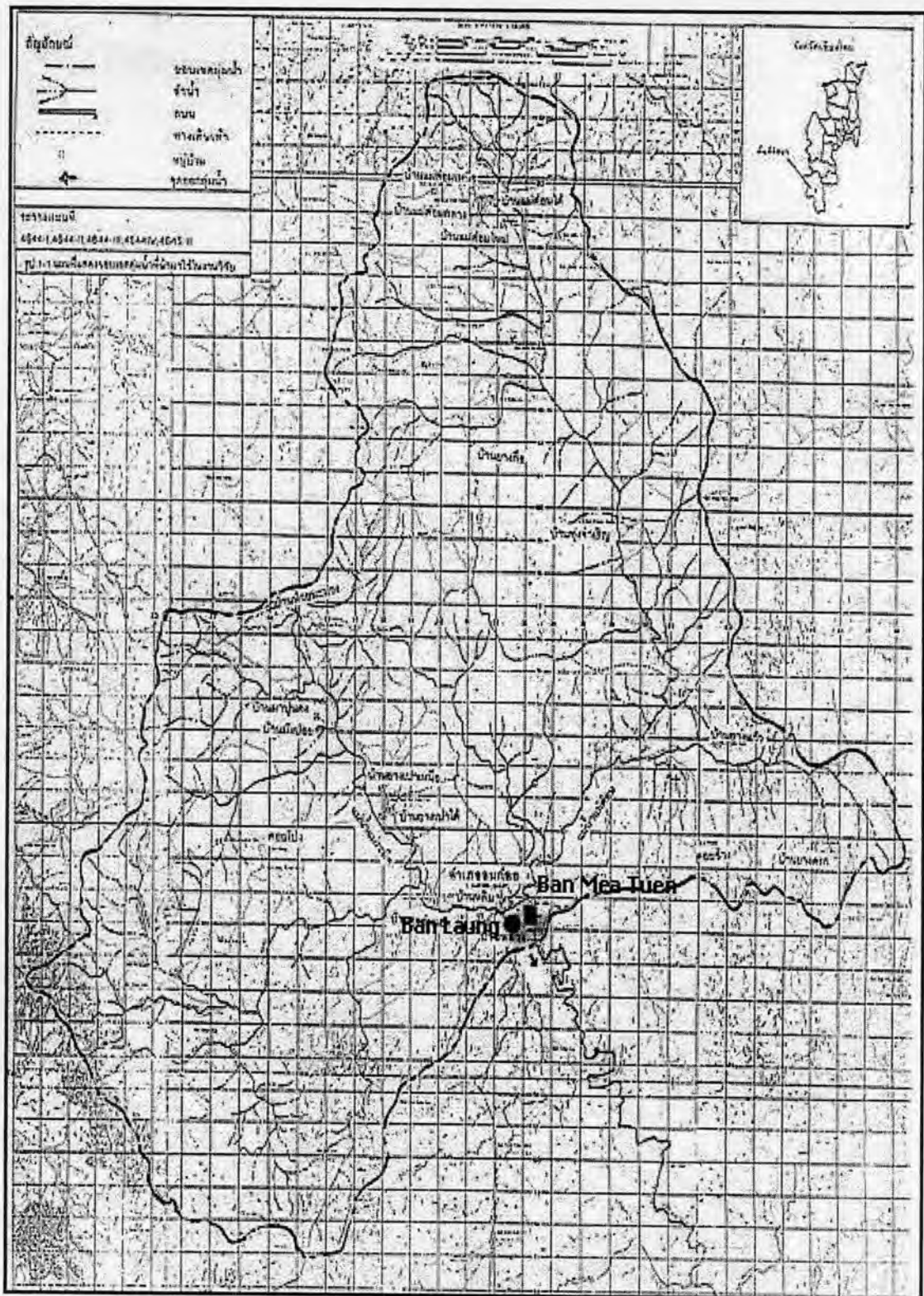


Figure A.2: Topographic map of the studied area.

Note: 1. ■ represents the location of rain station P.64.

2. ● represents the location of hydro station P.64.

VITAE

Mr. Prem Junsawang was born in February 28, 1982, in Yasothon, Thailand. He received a bachelor degree in Mathematics from the Department of Mathematics, Faculty of Science, Khonkaen University, Thailand in 2004.

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