

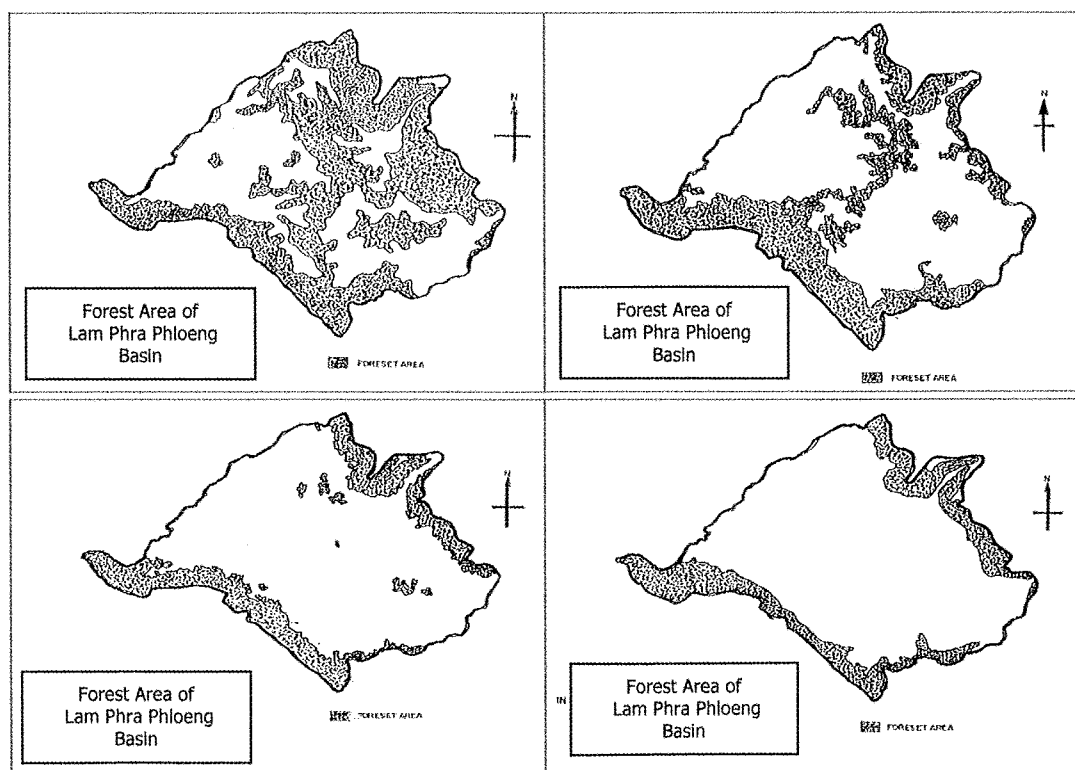
## Effect of Land use Change on Soil Erosion and Sedimentation at Lam Phra Phloeng Reservoir in Northeastern Thailand.

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To predict the lifespan of the reservoir, which capacity was reduced by sedimentation, both sediment inflow volumes generated from the upstream of the catchment and the deposition in the reservoir of the Lam Phra Phloeng were calculated. The rating curve of the relationship between discharge and sediment at station M.145 during the years 1996 to 2000 plotted by using water level discharge and sediment program (LQS) showed that the annual sediment volume resulted from the inflow of Lam Phra Phloeng catchment (820 km<sup>2</sup>) was 0.36553 Mm<sup>3</sup> (million cubic meter). Therefore, the siltation rate and annual sediment volume in reservoir was : the first period from 1970 to 1983, annual sediment volume was 2.23 Mm<sup>3</sup> and erosion rate was 2.72 mm/yr/km<sup>2</sup> coincident with the 73.57 % of the forest area had been decreased, the second period from 1983 to 1991, annual sediment was 1.625 Mm<sup>3</sup> and erosion rate was 1.98 mm/yr/km<sup>2</sup> due to the 1.05 % of the forest area has been increased, the present period from 1991 to 2000, annual sediment volume was 0.36553 Mm<sup>3</sup> and erosion rate 0.445 mm/yr/km<sup>2</sup> due to the 4.95 % of the forest area has been increased.

The agriculture of Thailand has shifted from subsistence farming to a cash crop culture since the 1960s to develop the socio-economy of the country. This shift has resulted in conversion of forests to cultivated lands. As a result, rapid deforestation occurred and then soil erosion in crop fields has become a serious problem of resource degradation. Thus, the soil erosion problem of crop fields has generally been recognized since the old days. According to statistics (National Statistical Office, 2003; Hasegawa, 1992; Tasaka, 1994), the area of forests of the whole of Thailand decreased from 29.1 million hectares (56.7 % of the total land) in 1961 to 13 million hectares (25 %) in 1998. Relative with the FAO statistical database (2005), the area of crop fields increased from 1 million hectares (2 % of the total land) in 1962 to 4.6 million hectares (9 %) in 1999, and the area of paddy fields also increased from 6.7 million hectares (13 %) in 1962 to 10.5 million hectares (21 %). The most deforested region is Northeast Thailand.



**Figure.1** Change of forest area in Lam Phra Phloeng Catchment Years 1974, 1979, 1985 and 1991