

Prayuth Graiprab 2012: Community Participatory Decision Support Model for Sustainable Water Resources Management in At Samat Watershed. Doctor of Philosophy (Sustainable Land Use and Natural Resource Management), Major Field: Sustainable Land Use and Natural Resource Management, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Kobkiat Pongput, Ph.D. 304 pages.

This study is to find out guidelines for sustainable management of water resources at At Samat watershed in Roiet Province as a model. This area was once focused as a Pilot model for poverty reduction by the previous government and it interested me to explore the cause of the problem. The study found that the root cause of the poverty was the improper agricultural use of soil and water. This led to low agricultural production, lacking of water in dry season and long term flooding in the rainy season. In addition, in the study area, along the Chi River's Bank has faced repetitive flooding, making it impossible to produce fruitful agricultural product. As a result, it caused economic, social and environmental problems.

This research, focused on five-dimensional frameworks for water resources management, namely potential of the watershed, environment, economic, participation and water management. These important components, could lead to sustainable development in the future by applying interdisciplinary technique as a tool of studying. The research was done by using a model of decision support making system to analyze the potential of the watershed. The model consisted of Soil and Water Assessment Tool (SWAT), Integrated Quantity and Quality Model (IQQM) and Hydro Dynamic Model (ISIS), which were used to determine and analyze the cause of droughts, floods and to find guideline of solutions. The model also included using high resolution of satellite map, scale 1:4,000 and topographic contour map of 1:4,000. In addition to ground surveys with high resolution theodolite, data survey for 90 kilometers length cross section of the river basin and field survey of water management with other agencies in the district and provincial level with community consultation were made in order to discover the problems and find ways to manage water resources properly. The data discovered and collected were synthesized and analyzed in five-dimensional applying Multi Criteria Analysis (MCA) and spatial analysis to determine the sustainability of the watershed at present and provide guidance in water management development in the future.

The result revealed that the average score of sustainability of all five dimensions was in the middle level, which was equal to 3.44. The problem found were due to the reason that the majority (98.33 percent) of people had low income. Their main occupation was farming, which generated income less than Baht 50,000/year/household, while 87% of them finished school in primary level. The main cause was from the inappropriate management of soil and water resources of the government. Therefore, I proposed this research project, with an aim to provide guidance to sustainable development, consisted of five plans to fix the problems. These plans were 1) to resolve repeatedly flooding 2) to reduce drought 3) to change land use 4) to support the management of water resources of local governments and 5) to strengthen the community. The analysis of sustainability in the future under the research framework found it could solve the problems in each dimension. The watershed could be able to define the problem accurately and in a sustainable water management in the future in which the sustainability score was in good to excellent.

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Student's signature

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Thesis Advisor's signature