

# Exploring Land Use Change with Combined Remote Sensing Techniques in the Upper Pennaiyar Catchment, South India

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## Abstract

Land use has a major effect on water resources. Especially in monsoon driven environments, the water availability is temporarily limited and sustainable land and water management are necessary. Due to its rapid population growth, new cultivation techniques and climate change, India faces a dynamic change process. For sustainable water management valid high resolution land use data is required to gain process based knowledge of a dynamic environment. The upper Pennaiyar catchment (~5300 km<sup>2</sup>) is an intensively used agricultural area. The cultivation technique in the catchment is based on a traditional network of water storage ponds, which was constructed for irrigation farming. The study aims at detecting and analyzing

modifications in land use and management over the last two decades. Multi-temporal remote sensing data of the Landsat (5 TM, 7 ETM+) and the IRS-P6 (LISS-III) satellites were used. Images from the early 1990s, near to the turn of the millenium and recent images have been analyzed by a combination of different approaches. Ground truth data, spectral measurements and knowledge based classification rules were combined to create high resolution (23-30 m) land use maps. The acquired high resolution data regarding land use and land management change is a valuable prerequisite to study hydrological change in this exemplary catchment in South India.

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