

SAWA PGD Fellow	:	S.Dhatchayani.
Institution	:	CWR, Anna university
Designation	:	
Title	:	Impact of Urbanisation on Landuse in Peri-Urban Chennai – A Case Study of the Catchment and Command Area of Chembarambakkam Tank
Email	:	



#### Background:

The water bodies meant for irrigation are nowadays being encroached upon and converted into solid waste dumping yards. To meet the urban water demands, the irrigation tanks are being transferred into drinking water sources too. A balance needs to be struck between satisfying the city's drinking water needs and sustaining the existing water resources. An attempt has been made in this study to analyse the above said objectives.

#### Study Area:

The Chembarambakkam Tank is the largest irrigation tank in Tamil Nadu, which is the southern most State of India. It was constructed during the Pallava Period, 400 years ago. The lake is located in 13°0'41.69" north latitude and 80°3'38.27" east longitude. It has a free catchment area of 77.13 km<sup>2</sup> and a combined catchment of 235.7 km<sup>2</sup>. The command area of the tank is 99.80 km<sup>2</sup>, which includes 38 villages. The tank has eight sluices. The Kovur village, which is one of the command area villages of Chembarambakkam Tank, was chosen to conduct the PRA. This village, once irrigated by the fourth and fifth sluices of the Chembarambakkam Tank, is sustaining agriculture even now with groundwater and provides the possibility of studying the agricultural status in the past and at present in this area.

#### Objectives:

- i. To understand the effects of land use changes before and after urbanisation
- ii. To estimate the surface runoff before and after land use changes
- iii. To examine the impact of socio-economic activities due to land use changes

#### Research Methodology:

The land use maps derived from the satellite imageries for the years 1973 and 2006 were used to identify the changes in land use that had occurred. GIS- based SCS-CN method and the TR 55 model were used to calculate the surface runoff from the free catchment area during the pre- and the post-urbanisation period. PRA techniques like the transect walk, social mapping and time line were used to find out the status of agriculture and people's perception on agriculture. Triangulation has been done with government officials to validate the information gathered from the local people.

The analysis of the land use changes revealed that there is an increase in built-up area (18.09%) and a considerable decrease in the barren land (46.14%). The area of the water bodies increased by 1.34%, is contributed to the initiatives taken by the state government towards the rejuvenation of the tanks.

The surface runoff for the year 1973 was estimated to be 20 Mm<sup>3</sup> and for the year 2003 it was 10 Mm<sup>3</sup>. The reduction in the surface runoff, inspite of increased built-up area was due to the improvements made to the water bodies.

## Research findings:

The time line exercise carried out shows the changes in status as follows:

- During the 1950s, there was intensive sugarcane cultivation practiced in this village since there was no shortage of tank water for irrigation. Government also provided subsidies and incentives for fertilizers and seeds.
- 
- During the 1960s, farmers started using pumpsets and dug wells which shows that groundwater was also being used. Tenant Farmers' Society was formulated and they indulged themselves in agricultural activities. Migrated people from the surrounding villages started settling there.
- 
- During the 1970s, farmers started cultivating three crops per year and paddy became the next important crop to sugarcane.
- During the 1980s, industrialization made people migrate to cities for jobs. Due to the increased infrastructure developments, land price went up, which motivated the people to sell their agricultural lands.
- 
- During the 1990s, because of shortage of agricultural labourer, labour charges went up. The better off farmers leased their lands to marginal farmers. Sugarcane cultivation got reduced to 30% and the sugarcane fields were converted as garden lands. During the latter 90s self help groups were formed. Most of the members of the group, who were originally agricultural labourers, started small scale industries and earned more money.
- 
- During the 2000s, the land prices increased multi-fold. As the Krishna Water Supply Project was started in the year 2001, tank rehabilitation work was commenced and so water was not released for irrigation purpose from most of the sluices. Only the large farmers continued agriculture to some extent by availing the latest technologies including machineries, while the small farmers neglected agriculture totally. Extension of the new airport up to this village also contributed to further reduction in agricultural practise. Literacy rate also went up. The younger generation was no more interested in sustaining agriculture though there was a good water and land facility. The older farmers were still a little concerned for agriculture but they too sought government support for obtaining security.

## Discussion:

The output of the social mapping shows that the social status of agricultural labourers has changed to non-agricultural. The economic status of the people went up due to this change in trend. The implementation of the Krishna Water Supply Project has strengthened the perception of conversion of the tank into a drinking water source. This, coupled with the increased transport facilities, made people convert their agricultural lands into buildings and shops.

The lands in the command area have undergone much transformation. Urbanisation has more impact on the land resources rather than the water resources in the study area. The tank was maintained by the state government to its full capacity to serve as drinking water source for the capital city. Urbanisation had increased the socio-economic status of the people though it had a negative impact on agriculture. The tank, as a whole, could be used as a drinking water source to meet the increasing demands of the city.