

Changes in Land use and Land Cover and Malaria Epidemiology in districts of Assam

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Abstract:

A study was initiated in Sonitpur and Nagaon districts of Assam using Remote Sensing and Geographical Information System (GIS) to assess the impact of changes in land use land Cover (LULC) on anopheline ecology and malaria epidemiology. IRS-1D LISS III data of 1999 and IRS-P6 LISS III data of 2008 of two districts Sonitpur and Nagaon was procured from NRSA, Hyderabad. The imageries were processed and classified using ENVI image processing software. A comparison of the classified LULC images of 1999 and 2008 of each district was carried out and large deforested areas were found in both the districts.

Deforested and forested areas and primary health centers (PHCs) were identified in both the districts. IRS-P6/LISS4 imageries of deforested PHCs were taken to identify major developmental activities after deforestation. The purpose of deforestation worked out to be settlement and agricultural activities in both the districts. Four field surveys were conducted during 2009-10 to collect entomological, epidemiological and socio-economic data from the identified PHCs. GPS locations of surveyed villages and track routes were generated in ARC-GIS 9.3.

A major development seen in the deforested areas of both the districts was the development of sub-stream network from the main streams for irrigation purpose. Also in forested villages of both the districts, some degree of deforestation was observed for agricultural purposes (mainly paddy cultivation). About two–three years back, these villages were situated inside deep forest, now they are 1 ½ km away from it. Here also, sub-stream network from main streams was developed for irrigation purpose.

An. minimus and An. dirus are the reported vectors of malaria from N-E region. Comparison of collected entomological data in deforested areas of Sonitpur and Nagaon districts revealed collection of An. culicifacies, An. philippinensis/An. nivipes, An. annularis and An. minimus species. From deep forested areas, An. dirus was recorded. Also as the forested villages are gradually being deforested and paddy cultivation is coming up with the development of irrigation network (channels), presence of An. culicifacies, An. nivipes and An. annularis in addition to An. minimus was noticed. Active fever survey and state collected malaria epidemiological data revealed more number of malaria positive cases in deforested PHCs in comparison to forested PHCs of both the districts. In deforested areas, disease transmission is being caused by two species namely An. culicifacies and An. minimus while in deep forested areas, An. dirus is involved.

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