Identification of Breeding Sites for Malaria Mosquito By Remote Sensing Technique In Northeastern Papua Indonesia

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Abstract: Malaria disease has been a national major impediment in Indonesia that is caused by the spreading of infected Anopheles mosquitoes. The major environmental factors of the disease are human, breeding sites, and the mosquito. This preliminary research aims to identify the breeding sites within the mosquito flight-range from human dwellings by remote sensing technique. For study area, Sentani that is located on latitude 2°34'0"S longitude 140°29'0"E will be selected because it was the urban area with meso-to-hyper endemic Malaria; and as for rural area, Arso will be selected because it was found to be the most hyper endemic, which located on latitude 2° 56' 25" S longitude 140° 46' 07" E. Advanced Space-borne Thermal Emission and Reflection Radiometer (ASTER), and Landsat-7 Enhanced Thematic Mapper Plus (ETM+) imageries will be collected in a time between March and April, 2000. The time is resulted from the total period of 28 – 62 days before the peak of Malaria disease between May and June, 2000 from a research in the Northeastern Papua Indonesia. The total period constitutes 10-23 days of the aquatic stage, 10-14 days of adult stage before biting human, and 8-25 days of incubation period within human's body. Firstly, Bakosurtanal hydrographic, urban and rural house digital data on scale 1:25,000 will be used for rectifying the imageries. Secondly, the imageries will be preprocessed to correct the atmospheric noises. Thirdly, classification will be conducted mainly for human dwellings and water bodies. Human dwellings will be identified as an origin point; and subsequently, small water bodies between the origin point to 1.5 - 6 km Anopheles species flight range will be identified by visible and near-infrared (VNIR) of ASTER and panchromatic of Landsat-7 ETM+ sensor imageries; and temperature of surface water will be identified by Thermal Infrared (TIR) of both sensor imageries. For further identification, sub-pixel will be applied by Goggle Earth. Expected results of this research will be a comparison of application of the ASTER and Landsat-7 ETM+ to identify distribution of the breeding sites in urban and rural areas, as well as limitation of the method from which future research will conduct an improvement for quality of the method.

Keywords: Malaria mosquito, water bodies, temperature, remote sensing technique