

Modeling and analysis of the contribution of fish farming to the population of the anopheles mosquito and its impact in malaria transmission

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It has been observed that in the Amazonic region of Acre, in the West of Brazil, fish farming contributes to the transmission of Malaria [1, 2]. This activity is carried out in artificial ponds that have become attractive spaces for mosquitoes to lay their eggs. Evidence has been found indicating that cleaning the vegetation from the edges of the crop tanks helps to control the size of the mosquito population [1, 2]. In this work, we introduce a model that represents the relation between fish ponds, the mosquito population and the transmission of malaria. We use this model to quantify the effective contribution of the fish tanks to the epidemic. The model consists of a system of nonlinear ordinary differential equations with jumps in the cleaning instants, which act as “impulsive controls”. We study the asymptotic behavior of the system in function of the intensity and periodicity of the cleaning [3, 4].

References

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