Modeling Corruption Dynamics Within Bono and Ahafo Police Service in Ghana

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Abstract : The existence of a culture of corruption within an institution, such as the police, could be a sign of failure from various angles. There is a general perception among Ghanaians that the most corrupt institution is the police service. The purpose of this study is to formulate and analyze a nonlinear mathematical model to investigate corruption as an epidemic within the Ghana police service, this study revealed the basic reproduction number for corruption extinction and corruption survival. The threshold conditions for all kinds of equilibrium points are obtained using linearization methods and Lyapunov functional methods, and they demonstrate local asymptotic stability for both corrupt endemic and corrupt free equilibrium states. The model was analyzed qualitatively, and the solution was derived. The model appears to be positively invariant and attractive. Therefore, the region exhibits positive invariance. Thus, it is adequate to think about the dynamics of the model. For the purpose of illustrating the solution, the graphic result was presented and discussed. Results show that corruption will die out within the police service if the government shows no tolerance for those involved in corrupt practices. Study findings indicate that leaders should be trustworthy, demonstrate a complete and viable commitment to addressing corruption, and make it a priority to provide mass education to all citizens as well as using religious leaders to fight corruption since most Ghanaians are religious and trust their leaders.