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Trade-offs and Synergies Between Livestock Intensification and Emergence of Zoonotic Diseases in Sub-saharan Africa

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Abstract

Understanding the link between agriculture and zoonotic diseases is important for a healthy and sustainable future. Zoonotic diseases are infectious diseases that are transmitted between humans and animals. Subject to type and intensity, livestock-human interactions significantly contribute to emergence and re-emergence of zoonotic diseases. The objective of the current study was to determine the trade-offs and synergies between intensifying livestock production and cases of zoonotic diseases in Sub-Saharan Africa. Specifically, the study focused on the factors that contribute to the development, spread and persistence of zoonotic diseases. Further, strategies for preventing and controlling zoonotic diseases were investigated. To address these objectives, a systematic literature review was conducted. A defined search criteria resulted in 237 peer-reviewed scientific articles and other publications covering the period between 1990 and 2021. Of these 122 articles were utilised.

Results showed some direct zoonotic trade-offs with increased livestock intensification. Increased livestock population due to intensification leads to increased transmission of infectious diseases. In this regard, the general spread of zoonoses is significantly influenced by changes in land use (such as deforestation). Further, intensification usually results in homogenous populations. Such homogenous livestock population have increased vulnerability to zoonotic epidemics spread. Intensification also results in increased international trade and human travel which in itself increases disease transmission risk. In most African countries like in most Low- and Middle-Income Countries, the problem is often exasperated by lack of infrastructure, poor human medical care, and education. One synergistic aspect that comes with intensification is that of the use of technology for improved productivity. This has a positive effect in that the same technology can also be used to monitor and mitigate any outbreaks of zoonotic diseases.

In order to mitigate the trade-offs and capitalize on the synergies, it is more important than ever to rely on interdisciplinary cooperation and to combine knowledge from different sectors in a 'One Health' approach., which links the health of animals, humans and the environment and thus provides the basis for future action

Keywords: Intensification, one-health, synergies, trade-offs, zoonosis