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Research Application Summary

GIS mapping of informal fish trade routes used by traders between Malawi and neighbouring countries

Nyengere, J.[1], Mwathunga, E.[2], Dulanya, Z.[2], Kaunda, E.[1] & Chimatiro, S.[3]

[1]Lilongwe University of Agriculture and Natural Resources, NEPAD Regional Fish Node, Bunda Campus, P. O. Box 219, Lilongwe, Malawi
[2]University of Malawi, Chancellor college, P. O. Box 18, Zomba, Malawi
[3]WorldFish Centre, Zomba, Malawi
Corresponding author: jabulaninyengere@yahoo.com

Abstract

The study focused at mapping of informal fish routes used by fish traders in cross border fish trade between Malawi and neighboring countries. A route labelling method using questionnaire survey and observation as described by Ramming (2002) was adopted and used for the study where GPS coordinates for boundary entry and exit points were captured and uploaded in ArcGIS as a shape file. GoogleEarth ® was used to get points for sources and destinations of fish products away from the data collection sites through marking of placements on all interacting points. The results indicate that fish traders involved in informal cross border trade leave the formal routes when approaching the border sites and use routes that bypass the border sites and rejoin the main route after crossing the official border sites. Fish traders use informal routes because of excessive government protocols for formal cross border fish trade, availability of unmonitored exit and entry points, lack of required travel documents for importing and exporting fish products, and tax avoidance. The study recommends that the Fishery Authorities and Non-Governmental Organizations' (NGOs) in the fisheries sector should facilitate review and amendment of cross border trade related policies that are perceived to be restrictive by fish traders, deploy vehicles to border posts for regular patrols along informal fish trade routes and encourage informal fish traders to form clubs or associations to reduce the cost of licensing with department of fisheries as resources will be poured together.

Key words: Cross border fish trade, GIS mapping, informal trade routes, Malawi

Résumé

La présente étude s'est focalisée sur la cartographie des itinéraires de pêche informelle, utilisés par les marchands de poisson dans le commerce transfrontalier du poisson entre le Malawi et les pays voisins. Une méthode d'étiquetage d'itinéraire utilisant une enquête par questionnaire et par observation, telle que décrite par Ramming (2002) a été adoptée et utilisée pour l'étude, où les coordonnées GPS des points d'entrée et de sortie des limites ont été capturées et chargées dans ArcGIS sous forme de fichier de forme. GoogleEarth a été utilisé pour obtenir des points pour les sources et les destinations des produits de la pêche loin des sites de collecte de données par le marquage des emplacements sur tous les points d'interaction. Les résultats indiquent que les commerçants de poisson qui exercent le commerce transfrontalier informel quittent les routes formelles proches des sites frontaliers et empruntent des

routes contournant les sites frontaliers et rejoignent la route principale après avoir traversé les sites frontaliers officiels. Les marchands de poisson utilisent des routes informelles en raison de protocoles gouvernementaux excessifs pour le commerce transfrontalier officiel du poisson, de la disponibilité de points de sortie et d'entrée non contrôlés, du manque de documents de voyage requis pour l'importation et l'exportation de produits de la pêche et de l'évasion fiscale. L'étude recommande que les autorités des pêches et les organisations non gouvernementales (ONG) du secteur de la pêche facilitent l'examen et la modification des politiques liées au commerce transfrontalier, perçues comme restrictives par les marchands de poisson, déploient des véhicules aux postes frontaliers pour des patrouilles régulières le long routes commerciales informelles du poisson et encouragent les marchands de poisson informels à créer des associations pour réduire le coût des licences auprès du ministère des Pêches.

Mots clés: commerce transfrontalier du poisson, cartographie SIG, routes commerciales informelles, Malawi

Introduction

Global Information System (GIS) is one of many information technologies that have transformed the ways geographers conduct research and plan for activities in communities (Al-ramadn, 2002). Sutton *et al* (2004) found that GIS is a technological tool for comprehending geography and making intelligent decisions. Through GIS, ability to input, analyse, and identify patterns makes geographers relevant in conversations about transport, public health, urban planning, and protecting the environment. For example, Gupta *et al*. (2003) opined that geographers bring GIS tools to bear on environmental problems through mapping sensitive environmental areas and identifying potential sources of pollution in the proximity.

Recently, in transport and urban planning, GIS technology has opened up new horizons in transportation planning and especially in travel demand modelling and routing (Alterkawi, 2001). This is where GIS provides the tool, a transportation planner would need to convey ideas and present implications of planning decision for non-planners visually. According to Gupta *et al*. (2003) GIS offers a means of communication that allows for an interactive understanding between the public and transportation professionals. Alterkawi (2001) established that GIS technology has developed an essential tool for the most effective use of spatial data. Furthermore, the ability of most GIS software to provide many basic transportation models and algorithms may also be useful in specific situations including route mapping (Alterkawi, 2001). According to Weber, (2000) the ability to link up to external procedures and software also provides flexibility, as these procedures can access data within the GIS and present the results of analysis to the GIS for viewing and analysis of geographical parameters. Understanding the significant roles of GIS in the modern world, this study used GIS to map informal cross border fish trade routes used by fish traders between Malawi and neighbouring countries.

Nduru (2004) described ICBT as an important form of trade contributing a substantial percentage of economic activity in the southern African economy even though it is almost entirely undocumented. Cross-border traders in southern Africa are called 'informal' because, generally, they travel with their goods, operate on a relatively small scale, do not access preferential tariff agreements, often buy and/or sell in informal sector markets, do not always pass through formal trade routes and may be involved in smuggling (Peberdy, 2002).

By definition, informal trade has been defined in different contexts depending on the scale of trade and study interest (Tekere *et al*., 2000). This study adopted the concept of informal trade as used by Scheele (2009) in relation to cross border trade who reported that "informal trade relates mainly to border areas, undeclared

overland trade between neighbouring countries". On the other hand, taxation has often been regarded as a characteristic of formal trade (MacGaffey, 1998). This study adopted Odegaard (2008) definition of formal trade routes. Odegaard (2008) defined formal trade routes as the trade routes where the fish traders follow all bureaucratic formalities and taxes to trade the fish products from one place to another.

Methodology

GPS surveying was done using handheld GPS devices to collect coordinates of the points where traders cross the boundaries of Malawi using the chosen route. The coordinate point data were used to identify the exact route being used when connecting the sources and destinations. Google earth was used to get points for sources and destinations of fish products away from the data collection sites through marking of placements on all interacting points. For the informal trade routes, data collection targeted the traders that are using other routes than the official government borders and a questionnaire was administered to the informal fish traders through direct interviews. Route labelling method using questionnaire survey and observation as described by Ramming (2002) was adopted and used for the study where GPS coordinates for boundary entry and exit points were captured and uploaded in ArcGIS as a shape file. The point feature was converted to "KML file format supported by GoogleEarth ® in ArcGIS to assist in the identification of the exact routes used by fish traders

Results and discussion

Informal fish trade routes between Malawi and neighbouring countries. The study mapped the informal fish trade routes between Malawi and her neighbouring countries. Firstly, the study mapped two main types of routes based on the type of trade associated with the route being formal and informal. Informal trade routes are associated with trade in legitimately produced goods and services, that escapes the regulatory framework set by the government, as such avoiding certain tax and regulatory burdens and they are not recorded officially by customs at the border post. The formal trade routes encompass routes used by fish traders that declare the fish products to be recorded officially by customs and enter into official statistics following set fish export and import. As the routes connect fish markets, the study further identified Mangochi, Salima and Karonga as primary sources of fish products (Fig. 1). The other markets were serving as secondary sources as well as final destination of fish products. In terms of the main routes used, the study established various informal routes as displayed in Figure 2.

Traders connect the sources and destinations using either formal or informal trade routes depending on trader's choice. The study showed that traders involved in informal trade leave the formal routes when approaching the border sites and use routes that bypass the border sites and rejoin the main route after crossing the official border sites (Fig. 2 a, b, c and d).

Conclusion

In terms of informal fish trade routes used by fish traders, the study mapped various informal trade routes bypassing the official border post including Songwe bypass, Nyasa, January and Timothy routes in Karonga, Fight, Nthache and Kanyani routes in Mwanza, Mkanda, Zalewa and Eleven routes in Mchinji, and Mtambalika, Maliera and Zumbira routes in Mulanje. The main informal routes identified by the study were the small roads joining the main route immediately before and after passing the official border posts. The use of informal trade routes by fish traders is mainly as a result of excessive government protocols for cross border fish trade associated with formal routes and availability of unmonitored exit and entry points.

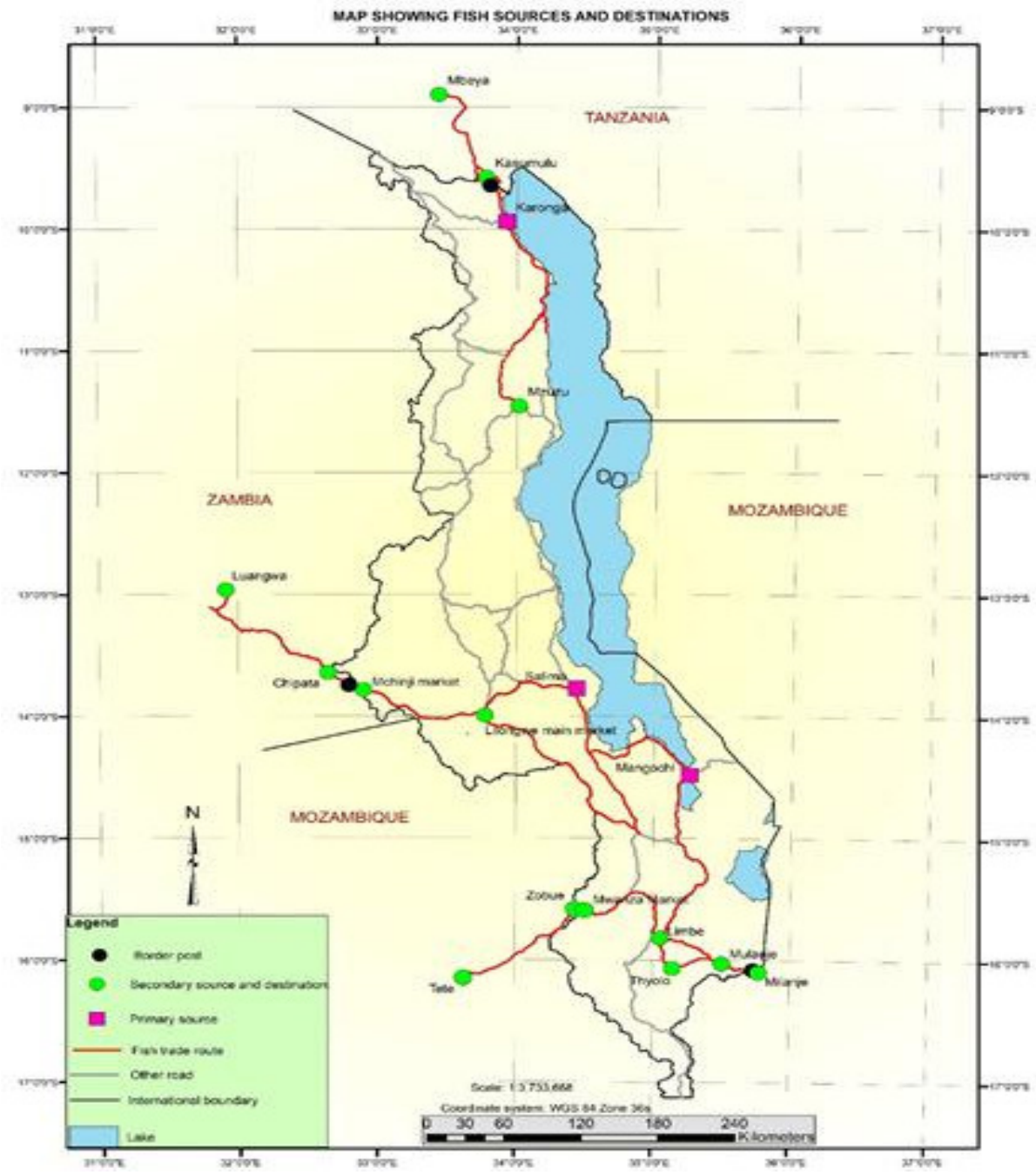

Figure 1. Fish trade routes connecting fish sources and destinations

This agrees with the legalist school of thought that growth of informal sector is mainly attributed to excessive and prohibitive regulations that traders fails to comply. Gardener (2008) through rational legalist theory explanation collaborate this finding that informal traders make choices basing on other factors perceived to be important regardless of what is deemed legal or illegal by the law. However, even though the trade remains undocumented, Nduru (2004) described informal cross-border trade (ICBT) as an important form of trade contributing a substantial percentage of economic activity in the southern African economy.

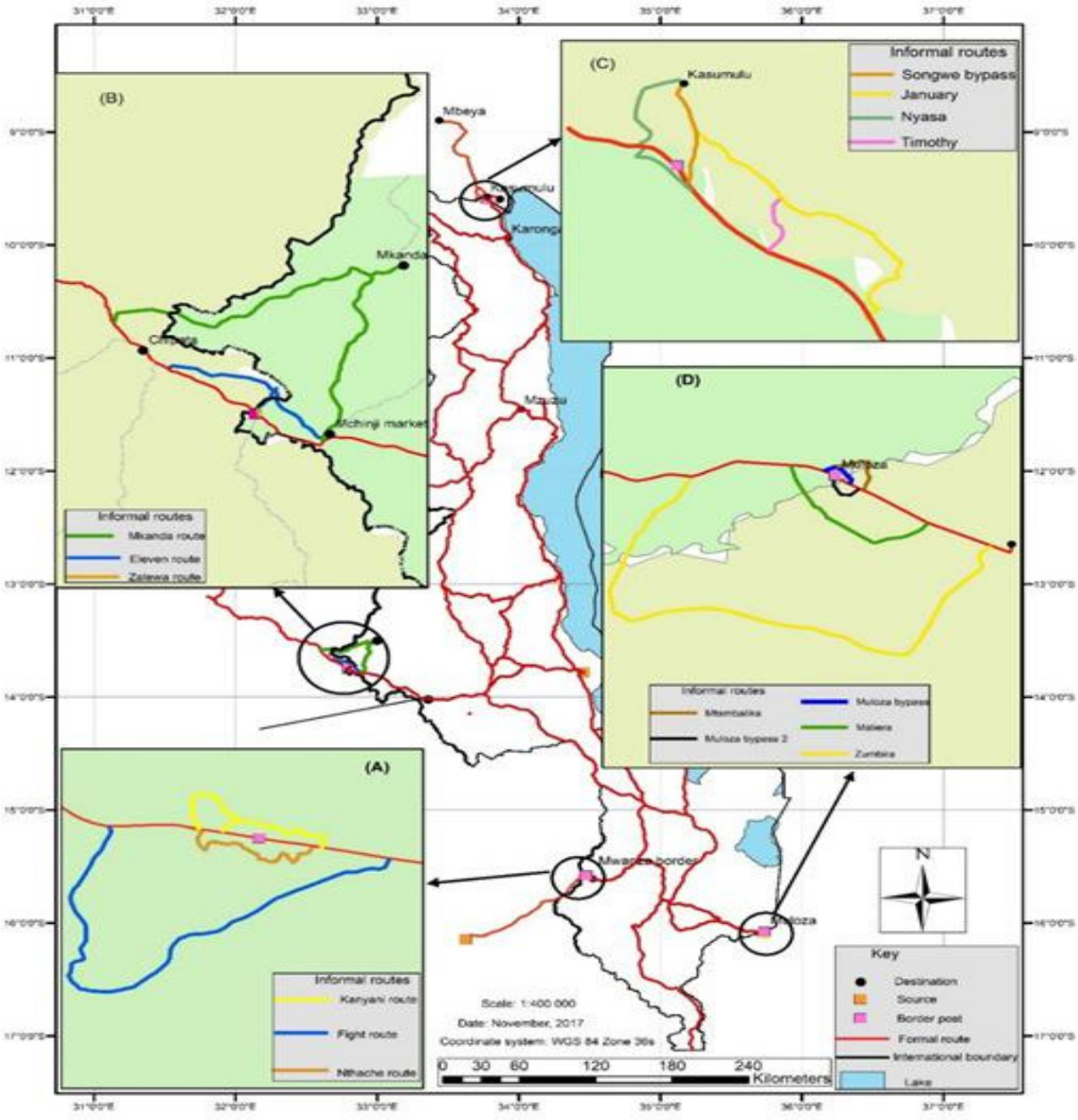

Figure 2. Informal fish trade routes in cross border fish trade (with extracts A, B, C and D)

However, even though the trade remains undocumented, Nduru (2004) described informal cross-border trade (ICBT) as an important form of trade contributing a substantial percentage of economic activity in the southern African economy. Fish traders choose informal trade routes because of cross-border regulations that are perceived to be restrictive for example to export fish products, a trader is required to possess a sanitary certificate, export and import permit, COMESA Simplified Trade Regime, and all these documents demand processing fee and duty stamp fees which most traders reported that they could not afford.

Recommendations

The study therefore derived the following recommendations:

a) Fishery Authorities and Non-Governmental Organizations' (NGOs) in the fisheries sector should facilitate review and amendment of cross border trade related policies that are perceived to be restrictive by fish traders.
b) Government should deploy vehicles to border posts for regular patrols along informal fish trade routes.
c) Informal fish traders should be encouraged to form clubs or associations to reduce the cost of licensing with department of fisheries as resources will be poured together.

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