

UNIVERSITI TEKNOLOGI MARA

**AN INVESTIGATION OF FACTORS
INFLUENCING THE CRITERIA OF
BUFFER ZONE FOR
CONSERVATION AREAS: A CASE
STUDY OF FRIM NATURAL
HERITAGE SITE, MALAYSIA**

CHE BON BINTI AHMAD

Thesis submitted in fulfillment
of the requirements for the degree of
Doctor of Philosophy
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student : Che Bon binti Ahmad

Student I.D. No. : 2011855376

Programme : Doctor of Philosophy (Built Environment) – AP990

Faculty : Architecture Planning and Surveying

Thesis Title : An Investigation of Factors Influencing the Criteria of Buffer Zone for Conservation Areas: A Case Study of FRIM Natural Heritage Site, Malaysia

Signature of Student :

Date : February 2021

ABSTRACT

Biodiversity holds most ecosystem processes and its decline affects the delivery of many ecosystem services. The awareness of the consequences of biodiversity loss is necessary through the emphasis of the role of biodiversity in sustaining livelihoods and human wellbeing. Conservation areas (CAs) in particular are meant to uphold the ecosystem sustainability for biodiversity conservation. Buffer zones (BZs) is claimed as a solution to save the intactness of CAs. Although the regulations, guidelines and management objectives of BZs for CAs are largely similar across the globe, there are great differences and very much depending on geographical, legal and managerial characteristic of individual BZ. These show the complexity of BZs among the stakeholders. A concept of BZs which is a 'dual function' – biodiversity conservation and human well-being is needed. It is based on multi-dimensional factors including physical, social, economic and other related factors. It should meet the requirement of the local context due to the micro ecological and socio-economic setting of the specific areas. Thus, it is indeed necessary to investigate the suitable factors in determining the criteria of BZs. The objective of this research are to evaluate the physical factors influencing the criteria of BZs, to analyse the perspectives of stakeholders to indicate the factors affecting the criteria of BZs and to evaluate the socio-ecological factors influencing the criteria of BZs. The study focuses on the area surrounding the FRIM Natural Heritage Site, Kepong, Malaysia. Taking the research as exploratory in nature, a convergent parallel mixed-method has been adopted. Three analyses were conducted, firstly, the spatial analysis using ERDAS Imagine and ArcGIS to evaluate the LULC with the data derived from remote sensing images and topographic maps, secondly, thematic analysis technique using ATLAS.ti 8 to analyse the perspective of stakeholders with the data derived from semi structured in depth interview, and thirdly, factor analysis using Structural Equation Model (SEM) AMOS to evaluate factors with the data derived from 499 questionnaires survey. The findings from the spatial analysis reveal that areas inside and the surrounding of the FRIM has changes in term of LULC for the year 2013 up to 2019. For the second analysis, the stakeholders have conformed to certain factors influencing the criteria of BZs. For the latter analysis, a model has emerged portraying the ecosystem services concept that may become the factors influencing the criteria of BZs. The methodological triangulation and integration performed has brought out a set of comprehensive list of factors. It reveals possible stakeholder alliances, and those that may need strengthening to guarantee the welfare of the forest reserve and the potential BZs. All stakeholders agree that the maintained ecosystem service can bring benefit to human and ecological forest as they need to be sustained. This research also enables factors from ecosystem service dimensions which divided into four groups namely provisioning, regulating, cultural and supporting. Therefore, the 'dual-function' of buffer zone has been achieved whereby the function of the ecosystem services is important for the biodiversity of forest to sustain, and the same time provides benefit to human well-being. It is comprehensive due to the inclusive of factors from multiple dimensions rather than one specific dimension. Thus, BZs may become more effective and further contributes to provide a better insight to the National Government policy makers, in their effort to formulate a more relevant strategy. The Town and Country Planning Department (JPBD) may consider the findings when preparing various physical planning plans in meeting the conservation actions that are capable of creating a sustainable development for the regions.

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