Statistical and Mathematical Models for a Sustainable Cultivation Plan - A Brief Review of the Literature

N.M. Hakmanage [1], N.V. Chandrasekara[2], D.D.M. Jayasundara[3]

Introduction

Due to rapid increase of population, demand for food is increasing. If the agricultural sector fails to supply and meet the rising demand of foods, it will affect the economy. This however requires finding viable solution that is balanced supply demand food chain. To fulfil subsistence food needs there should be a stationary state with proper cultivation plans in agricultural sector in a country.

This study presents a review of the literature published between 1998 and 2019 on cultivation plans in the areas of statistics and/ or mathematics which have considered major influential factors for cultivation. This study aims at reviewing the most appropriate sub sections: arable land selection, cultivating methodologies and climatic factors effect on cultivation to build an optimal cultivation plan. Review was conducted using separate articles as searching strategy was failed to identify published articles which studied for these three aspects together. Hence the significance of this study is to discuss how to apply statistical and/ or mathematical models which are used to implement the cultivation plan including all influential factors together.

Methodology

This study investigated statistical and/ or mathematical models/ methodologies that can be used to develop an optimal cultivation plan. Following search terms were used in this study: cultivation plan, agricultural plans, development of agriculture, arable land selection, climatic factors effect on cultivation, cultivating methodologies, optimal cultivation plans. First searching round based on the keywords which are located within the text instead of being matched to subject headings. Then move to the advanced searching, that is, chose to add Boolean operators AND, OR and NOT. These strategies yielded about 50 articles that were closer to the topic of interest published between 1998 and 2019 Among the 50 references initially identified, 25 were excluded after review of the titles and abstracts or else non-English publications and research which are not under mathematical background.

Results

A systematic way to select a suitable land for cultivation proposed by Elsheikh, is Agricultural land suitability evaluation (ALSE), an intelligent system for assessing land suitability considering spatial geo-environmental factors such as soil, climate, slope, erosion and flood hazard. Factors were weighted under supervision of expertise and then

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