# Social-economical Database Implementation into GIS to Analyse Land Suitability for Citrus Fruit Production: A Case Study in the Thua Thien Hue Province, Vietnam

CHUONG VAN HUYNH[1], MICHAEL BÖHME[2], MICHAEL LA ROSA[3]

[1] *Humboldt-University Berlin, Faculty of Agriculture and Horticulture, Germany*
[2] *Humboldt-University Berlin, Horticultural Plant Systems, Germany*
[3] *Humboldt University Berlin, Horticultural Economics, Germany*

## Abstract

Agricultural land suitability analysis and land use planning is being considered as a very complex process usually solved by multi-criteria and interdisciplinary approaches. In general, land suitability analysis takes into account the influences of physical in relation to socio-economic, infrastructure and environmental issues for agricultural crops. The study aims at integrating the socio-economic, infrastructure databases into GIS together with the physical data for land suitability analysis. A case study in an area of about 6637 hectare in Thua Thien Hue Province, Vietnam has been conducted. This area is characterised by 4 major soil groups with 16 soil units; slopes ranging from 3° -15°, topsoil depths from 30 cm to more than 100 cm; scarce water resources, summer drought and winter heavy rain; very poor to moderate soil fertility. The rural infrastructures and socio-economic status are underdeveloped and not very attractive for agricultural development. Growing local citrus species in smallholder farms at low management and investment level using mainly family labour with potential to extension of cultivated area is the land use type proposed for this study. Through the integration of physical, socio-economic and infrastructure data in GIS, suitability level analysis and criteria development could be divided into two stages: land physical and socio-economic and infrastructure evaluations. The study has proved that the integration of databases into GIS is a very powerful and robust tool for land suitability analysis and decision making process. Besides the physical factors, the socio economic and infrastructure factors used in this study mainly consist of 5 main criteria (rural road systems, inputs-market-prices, accessibility to technology, capital and labour availability, institutions and policies) with 3–6 sub criteria for each main criterion. The result showed that all those factors affected the suitability for citrus fruit production. Market-prices, inputs and technology in socio-economic group and low soil fertility, scarce water resources in physical group are main constraint factors for decision of area extension. It can be concluded that the investigated area is marginally till moderately suitable for citrus fruit production.

**Keywords:** Citrus, GIS, land suitability, physical factors, social-economic factors

---

**Contact Address:** Michael Böhme, Humboldt-University Berlin, Horticultural Plant Systems, Lentzeallee 75, 14195 Berlin, Germany, e-mail: michael.boehme@rz.hu-berlin.de