Evaluation of Physical Land Suitability for the "Thanh Tra" Pomelo Crop in Hue, Vietnam

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Introduction

"Thanh Tra" pomelo (*Citrus Grandis* L. Osbeck) is one the major special fruit crops in Hue, Central Vietnam. Its product not only supplies to domestic market but also exports. A number of organizations and local people are interested in the suitability area for "Thanh Tra" pomelo so as to estimate and expand the production. So physical land evaluation and suitability map establishment for "Thanh Tra" pomelo are pressing to determine the suitability level for each land unit. Main objective of this study is to assess physical land suitability for the "Thanh Tra" pomelo crop according to the local priority list through an approach within GIS context, based on FAO land evaluation framework (1976, 1983), modified for Vietnamese conditions. Outputs produced from this database can provide local policy makers, researchers and farmers with important information for land use planning, strategic planning and investment.

Study area and materials used

- The study area chosen is a hill village Thuy Bang, Hue, central Vietnam at approximately $16^0$25'S and $107^0$27'E and at an altitude of 100 m, and covers an area of 2106.27 hectares with 5 major soil groups, Acrisols, Cambisols, Fluvisols, Gleysols, Leptosols and divided into 16 soil units (FAO/UNESCO/WRB). Climate data has been recorded since 1934-1998 at Hue climate and meteorological station showed that monthly mean temperature is about 25.10^0C, mean annual rainfall is about 2600 mm, but erratic rainfall distribution, mainly in rainy season from September to January.

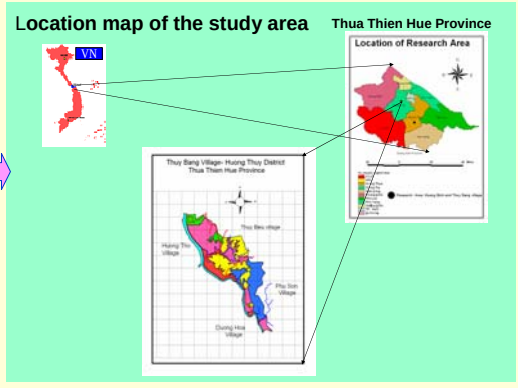
***-Materials used for this study are*:**

*Source of maps with scale 1: 10000 was collected and edited from Thua Thien Hue department, district, village offices

*Source of attribute data was collected from statistic center of Thua Thien Hue department, district, village offices and questionnaires.

*ArcView 3.2, MapInfo 7.5 and Excel software were used to analysis, store, query and outputs.

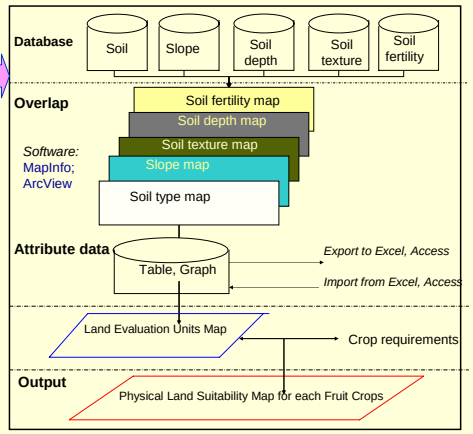
Location map of the study area **Thua Thien Hue Province**



Methodology

The methodology used for the physical land suitability analysis for "Thanh Tra" pomelo is a multi-criteria evaluation approach within GIS context, based on FAO land evaluation framework (1976, 1983), modified for Vietnamese conditions. The methodology consists in matching soil/land qualities against "Thanh Tra" pomelo needs and assigning a suitability rating to each land characteristic.

Chart of GIS application to physical land suitability

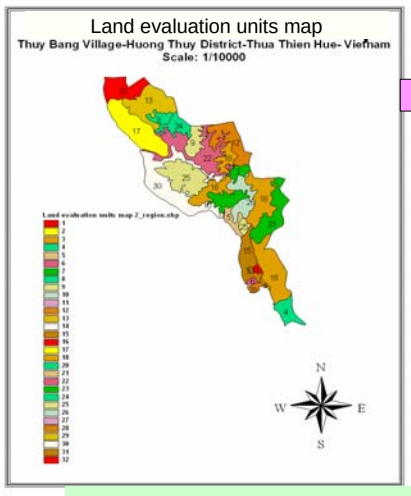


Results and discussion

Description of the selected "Thanh Tra" pomelo crop.

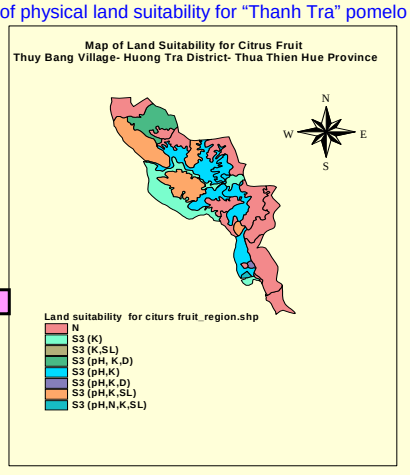
Scale of "Thanh Tra" pomelo production is in smallholders at low management and investment level. Water resource used for "Thanh Tra" pomelo is mainly rainfed and a small part by a well equipped with a pump. Labor force is mainly from family and hired

Map for land evaluation units of Thuy Bang village



* There are five major soil groups with 32 land evaluation units of 2106.27 ha in research village
* Current soil fertility of study area is poor and very poor, namely, limiting factors: pH>K>C>N>P

Map of physical land suitability for "Thanh Tra" pomelo



1322 ha of 2106 ha is current marginally suitable (S3) for "Thanh Tra" pomelo (63%); if improved, 556 ha (26%) and 765 ha (37%) of 2106 ha are potentially moderately suitable and marginally suitable, respectively. Non suitable (N) is 740 ha (37%).

Conclusion

1. The results obtained from this study indicate that the application of GIS and multi-factor evaluation could provide a superior database and guide map for decision makers considering to replace non-suitable crops by the suitable crops.

2. It should also be noted that citrus fruit production development are formed by the interactions between physical and social-economic factors. Therefore, this study will be continued to answer the more comprehensive results.