

C
363.7
NAV

Theses.

**ENVIRONMENTAL IMPLICATIONS OF CARDAMOM
CULTIVATION IN THE KNUCKLES RANGE**

A thesis submitted by

WEKADE MUDIYANSELAGEDARA NAVARATNA

*in partial fulfillment of the requirements
for the degree of*

Master of Arts

in the Department of Geography
Faculty of Arts
University of Peradeniya
Sri Lanka
1996

Dept. of Environmental Science
Inst. of Fundamental Studies
Kandy

555839



ABSTRACT

This study was carried out with the broad objective of collecting baseline information through field observation on environmental implications of Cardamom cultivation in the Knuckles range. The specific aim was to identify the critical elements of land degradation in the Knuckles range in relation to Cardamom cultivation.

The research study was mainly centered around the following themes.

1. Cardamom cultivation and its relationship to elevation and slopes
2. The implications of Cardamom cultivation on surface soil and forest ecology
3. The impact of Cardamom cultivation on the natural forest vegetation

Several aspects of Cardamom cultivation in the Knuckles range were investigated through field surveys. The variation of the characteristics of Cardamom plant at different elevations and slopes have been identified. The analysis of data shows that the growth of the Cardamom plant reaches its maximum on elevations around 1200 metres. Similarly elevations from 1100m to 1250m produce a greater number of bunches of cardamom. The highest number of bunches per clump of cardamom that can be harvested on the Knuckles range are found in slopes ranging from 20 to 30 degrees.

The soils of Cardamom cultivated forest with that of an adjoining natural forest and patana land were compared. For this purpose several sites were selected from Corbert's-

gap and Tangappuwa area. Soil samples were collected and analyzed to determine soil texture by employing the pipette method as described by Gee and Bauder (1986). Further, soil organic matter content was analyzed using Walkey and Black (1934). The results show that in the forest area the 'A' horizon was well preserved with a good cover of mulch. The maximum depth of soil at all locations was found to be 20-50cm. With regard to soil moisture content it was found that the values obtained were significantly higher for natural forests. This may be due to the higher clay content and higher organic matter content in natural forest soils.

In relation to the impact of Cardamom cultivation on the forest vegetation the basic approach was to compare the vegetation of a selected number of Cardamom cultivated site and that of an adjoining natural forest area. Some comparative field observations using 20x20m plots were made on plant communities in the Cardamom plots and those in the adjoining forest patches. The intention was to test the hypothesis, that the regeneration, species density, species richness, and litter accumulation of forest plants within cardamom plots, are significantly different from those in the natural forest. The general pattern of girth class distribution at natural forest sites show an inverted 'J' shape which is characteristic of relatively undisturbed natural forest. The results show that density of *Calophyllum walkeri* and *Syzygium cordifolium* is higher in natural forest than that the cardamom land. Further, the litter accumulation was higher in the natural forest.

In general, field information indicates that Cardamom cultivation has adverse effects on the forest ecology in the area. The results therefore, tend to contradict the claims made by some cardamom growers that, it has no significant negative ecological impacts. Since it is practised under the shade of trees. However, it must be mentioned that the

present study deals with only a few parameters. Further investigations are needed to determine the effects on hydrology, micro-climatology, wildlife and other aspects of the montane environment.

ABSTRACT

CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF MAPS

LIST OF APPENDICES

Chapter 1

Introduction

1.1. The Study Area	1
1.2. Objectives of the Study	2
1.3. Historical Background	3
1.4. The Research Method	4
1.5. General Findings	5
1.6. Conclusions and Recommendations	6
1.7. Bibliography	7
1.8. Maps	8