CONTENTS:

PAGE		THESIS CONTENT		
	Thesis structure	e and Presentation Model.		
1.	Introduction	_		
2.	I.	From Transition to Transition.		
4.	II.	Ecology - the science of totality of man and environment.		
6.	III	Rural Ecology - its relevance to India.		
8.	IV.	Rural Ecosystems - a general view.		
Thesis Component I.				
11.	William Company of the State of	nesis of the present analytical and perimental study.		
12.	I.	Literature Screening.		
14.	II.	Micro-level analysis.		
16.	III	Grass-root level strategies.		
17.	IV.	Selection Survey.		
19.	v.	Challenges (Approaches).		
21.	<u>Unit II</u> : App	proaches used in the present work.		
22.	(A)	Ecosystem Analysis.		
22.	I.	Analytical Ecology.		
24.	II.	The Nature of Analytical ecological Models.		
25.	•••	1. Analytical Qualitative Model.		

2. Ecosystem Analytical

Description Inventory.

26.

30.	• • •	Component	-wise methodology description.
30.		(1) Phy	sical environment
32.	• • •	(2) Eda	phic environment ,
33.	• • •	(3) Soc	io-cultural-economic environment.
34.	• • •	(la) Vegetational system.
35.	• • •	(1b) Crop system.
36.	• • •	(2a) Animal population.
36.	• • •	(2b) Human population.
37.		(3)	Decomposer Component
38.	• • •	III.Component	Information Data Sheets.
39.	• • •	(B) Ecosystem	Optimization.
39.		(a) Conce	ptual Frame Work.
39.	• • •	(b) Appro	aches for Chokari Rural Ecosystem.
40.	• • •	(c) <u>Case</u>	Study.
40.	• • •	Mater	ial
42.	•••	Metho	dology
42.		(a) G	ermination Behaviour.
42.	• • •	(b) M	orphological Behaviour.
43.	• • •	(c) F	unctional Behaviour.
44.	• • •	(d) G	rowth Behaviour.
46.	• • •	Agron	omic practices
47.		Plant	sampling.
48	• • •	Infor	mative Note.
49.	Unit	III :A gener∂l acc	ount of Rural Ecosystem at Chokari.
50.		I. Location.	
50.		II. Agricultu	ral Environment.

51. ... IV. The River Mahi. 52. ... V. The estuarine settings. 53. ... VI. The 'Man' in rural ecosystem. ... VlI.The 'Nature' in ecosystem. 54. Thesis Component II. 56. Abiotic Compartment: Analytical Results. 57. Basic Conceptual Comprehension. The Physical Environment. 59. Unit I: 60. Physical macro-environment of Gujarat. 60. Geo-physiographic aspects. 61. Climatological aspects. . . . 63. ... II. Physical micro-environment of Baroda and Chokari rural ecosystem. 63. Geo-physiographic aspects. 1. . . . 63. Climatological aspects. . . . 75. ... III. Ecoclimatic aspects. . . . 75. (a) Concept. 78. (b) Position of Gujarat. (c) Position of Chokari. 78. Unit II : Edaphic Environment. 80. Litho-edaphic complexes(Gujarat). 81. ... I. II. Edaphic complexes of Baroda and Padra. 84. . . . 86. ... III. Analysis of Edaphic environment of Chokari rural ecosystem. Unit III: The Socio-cultural-economic environment. 93. Socio-cultural environment. ... I. 94.

... II. Economic environment.

... III.Natural Zonation.

51.

97.

Thesis Component III.

- 100. Biotic Compartment : Analytical Results.
- 101. <u>Unit I</u>: Autotrophic (Producer) Component.
- 101. Sub-Unit A: The Vegetational system.
- 102. ... Basic Conceptual Comprehension.
- 104. ... I. Analysis of Vegetational System.
- 114. ... II. Phenological Analysis.
- 120. ... III. Growth form and period Analysis.
- 121. ... IV. Ecozonal Categorization of Vegetational System.
- 128. ... V. Eco-stresses on Vegetational System.
- 130. Sub-Unit B : Crop Systems.
- 131. ... Basic Conceptual Comprehension.
- 133. ... I. Land Utilization Analysis.
- 138. ... II. An agroclimatological land classification.
- 140. ... III.Farming system non-saline ecozone.
- 141. ... IV. Farming system saline ecozone.
- 143. ... V. Cropping and Harvest Calender.
- 144. ... VI. Energy Inputs.
- 146. Unit II : Consumer Component
- 146. Sub-Unit A: Animal populations.
- 147. ... Basic Conceptual Comprehension.
- 148. ... I. Bovine Structure of Chokari.
- 150. ... II. Interaction of the animal population.

154. Sub-Unit B : Human Component. 155. ... Basic Conceptual Comprehension. 156. ... I. The Demographic Structure. 158. ... II. Human environment Analysis. 161. ... III. Human Settlement Analysis. 166. ... IV. Human Interactional Analysis. 168. Unit III : The Decomposer Component. (a graphic view). Thesis Component IV. 172. Ecosystem Optimization - Experimental study. 173. <u>Unit I</u>: Ecosystem Optimization. ... I. A macroview. 174. 175. ... II. Optimization of agricultural output. 176. ... III. Optimizing machinery for Agriculture. Unit II: Optimization in Natural Farming Systems. 179. 180. ... I. Natural Farming System. ... II. An assessment of Chokari agro-ecosystem. 182. Unit III: Case Study: Evaluation of halophytic 185. potential of some improved wheat varieties in saline edaphic zone for optimization of agroecosystem output. Back drop. 186. ... I.

... II. Selection of wheat varieties.

phenophase.

... Experimental Results

Importance of Germination and Seedling

188.

191.

193.

```
193.
               ... (a) Germination behaviour
195.
                       Seedling Mortality.
197.
               ... (b) Morphological behaviour
                       I. Root length - Shoot length.
199.
201.
                       II. Root length - Shoot length Ratio.
               . . .
                       III.Leaf Area.
203.
206.
               ... (c) Functional behaviour
206.
                       I. Phytomass Production.
209.
                       II. Root and Shoot Phytomass Ratio.
209.
                       III. Net Primary Productivity.
                       IV. Moisture Structure.
215.
               . . .
215.
               ... (d) Growth behaviour
                       I. Relative Growth Rate (RGR)
217.
                       II. NetAssimilation Rate (NAR)
221.
               . . .
                       III.Leaf Area Ratio (LAR)
224.
                       IVa. Shoot Weight Ratio (SWR)
224.
                       IVb.Root Weight Ratio (RWR)
227.
        . . .
               . . .
                       IVc. Specific Leaf Weight (SLW)
227.
               . . .
        . . .
                       IVd. Specific Leaf Area (SLA)
227.
               . . .
                       IVe.Leaf Weight Ratio (LWR)
227.
231.
               ... <u>Discussion</u>
         . . .
242. Inferential Summary and Conclusions
261. Epilogue
        I. Analytical Qualitative Model of Estuarine Rural
262.
            Ecosystem at Chokari.
266.
        II. Recommendatory Observations.
```

269. Bibliography.

302. Appendix

Thesis Structure and Presentation Model:

Forrester (1971) has aptly remarked that each of us uses models constantly. According to him, a mental image is a model. All our actions are based on the models we have perceived in our mental makeup.

An ecologist dealing with the ecosystem is not only trying to obtain the qualitative or quantitative model of his ecosystem but also has to perceive along with his ecosystem investigations, the model of presentation of his research data. Such a model was constantly perceived by the author during the study period and the thesis is structured on the basis of the final mental image which emerged after series of evolutionary images perceived by the author over the study period (1972/73-1976). The diagram depicts the structure of the present thesis and the presentation model. Being self-explanatory, the diagram is not in need of 'word models' for its description (PLATE 1).

Plate - I: The Thesis has four components which are further divided into three units each. The component I begins after a brief Introduction to the Subject and the component IV is followed by the summary and conclusions of the investigations as well as with an epilogue of the thesis.

THESIS STRUCTURE AND PRESENTATION MODEL

INTRODUCTION

THESIS COMPONENT I

GENESIS OF THE PRESENT ANALYTICAL & EXPERIMENTAL STUDY

APPROACHES USED & GENERATED IN THE PRESENT STUDY

THE ESTUARINE RURAL ECOSYSTEM AT CHOKARI-A GENERAL ACCOUNT

THESIS COMPONENT II

ABIOTIC COMPARTMENT

PHYSICAL ENVIRONMENT

EDAPHIC ENVIRONMENT

SOCIO CULTURAL-ECONOMIC ENVIRONMENT

THESIS COMPONENT III

BIOTIC COMPARTMENT

AUTOTROPHIC | A - VEGETATIONAL SYSTEM

COMPONENT | B- CROP SYSTEM

CONSUMER | A - ANIMAL POPULATION COMPONENT | B - HUMAN POPULATION

DECOMPOSER COMPONENT

THESIS COMPONENT. IL

ECOSYSTEM OPTIMIZATION VIEWS

OPTIMIZATION IN NATURAL FARMING

CASE STUDY: WHEAT VARIETIES IN SALINE ECOZONE

INFERENTIAL SUMMARY & CONCLUSIONS