

37

**ECONOMIC ANALYSIS OF
CONSTRAINTS ON MODERNISATION OF
AGRICULTURE IN THE SANGLI DISTRICT
OF MAHARASHTRA**

MAY 1980

K.G. PATIL

**ECONOMIC ANALYSIS OF
CONSTRAINTS ON MODERNISATION OF AGRICULTURE
IN THE SANGLI DISTRICT OF MAHARASHTRA**

A THESIS
SUBMITTED TO
THE UNIVERSITY OF POONA

FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
(IN ECONOMICS)

BY
K. G. PATHAN

**GOKHALE INSTITUTE OF POLITICS
AND ECONOMICS**

PUNE 411 004

MAY 1980

ACKNOWLEDGEMENTS

The major part of this work was carried out during the period from 1977 to 1980 at the Gokhale Institute of Politics and Economics, Pune 4. I was a full time Teacher Fellow under the Faculty Improvement Programme of the University Grants Commission for which I am grateful to the authorities of the University Grants Commission and Dr. V. M. Dandekar, Director of the Gokhale Institute. The present research work was undertaken under the guidance of Dr. N. K. Kulkarni, Principal, Chintamanrao College of Commerce, Sangli. I am highly obliged to him for the active interest and encouragement advanced throughout the progress of this work. I am especially grateful to him for he also maintained a meticulous care for academic freedom. I must acknowledge my debt to Dr. M. V. Namjoshi, Professor of Research, Vaikunth Mehta National Institute of Cooperative Management, Pune 16, for having kindly given critical observations and positive remarks at every stage of the analysis.

During the five years spent in this research work, I greatly benefited from the ideas, criticism and support of many persons. I am particularly grateful to Dr. G. R. Mulla for having gone through the earlier version of the thesis. I am also thankful to Dr. A. U. Shaikh, Ex-

Director, Vaikunth Mehta National Institute of Cooperative Management, Pune, Dr. Waheeduddin Khan, Senior Faculty Member, Administrative Staff College, Hyderabad, Dr. J. F. Patil, Shri M. P. Khare, Dr. L. W. Ambegaonkar, Prof. J. L. Gandhi and Prof. T. K. Mulani. I wish to thank Dr. N. Rath, Joint Director and Shri D. P. Apte, Registrar at the Gokhale Institute, who provided generous assistance whenever problems arose during my stay in the Institute. I am grateful to Dr. R. G. Paithankar, Chatrapati Shahu Central Institute of Business Education and Research, Kolhapur, for his valuable guidance in planning and execution of the work of data processing and tabulation.

This thesis would not have been completed without the generous help of the authorities of the Latthe Education Society, Sangli and Principal V. T. Chougule, who granted me the leave in prosecuting this study. My debt to Principal V. T. Chougule is too great to be expressed adequately in words.

My sincere thanks are due to Sarvashri V. V. Agashe, Shashikant Ruddy, Altaf Shaikh and the staff of the Servants of India Society Library. The manuscript prepared by me was not neat and tidy. I left it to the efficiency of Shri S. K. Athale to read it and type it. He has done this job exceedingly well. I cannot forget his debt.

I am also grateful to my parents for their

(iii)

affectionate encouragement which sustained my enthusiasm through all the hazards of my academic career. Last but not the least, I thank my wife Munawar Bano, who has cheerfully and ungrudgingly borne the unwanted externalities of my research and many hours of silence.

Teacher Fellow (FIP)
Gokhale Institute of
Politics & Economics
Pune 411004

K. G. Pathan

May, 1980

C O N T E N T S

	<u>Page</u>
ACKNOWLEDGEMENTS	(i)
LIST OF TABLES	(v)
<u>CHAPTER</u>	
I INTRODUCTION	1
II METHODOLOGY AND THE CONCEPTS	25
III THE STUDY AREA	47
IV STRUCTURE OF THE FARM	100
V FARM LEVEL FACTORS INFLUENCING THE CROPPING PATTERN	143
VI PER ACRE COST, OUTPUT AND PRODUCTIVITY	172
VII PERFORMANCE OF MAJOR CROPS : LOCAL V/S HYV	198
VIII THE YIELD GAP AND THE CONSTRAINTS ON HYV YIELDS : AN EXERCISE	259
IX SUMMARY AND CONCLUSION	285
APPENDIX	300
BIBLIOGRAPHY	329

LIST OF TABLES

<u>Table No.</u>		<u>Page</u>
1.1	Growth Rate of Food Production in India	6
1.2	Compound Growth Rates of Important Cereals in Area and Yield	8
1.3	Growth Rates of Resource Use	12
2.1	Selection of the Sample Farmers	29
2.2	The Average Price Level of the Agricultural Commodities During 1974-75	40
3.1	Geographical Areas, Villages, Population and Net Sown Area in Sangli District	49
3.2	Statement Showing Number of Rainy Days, Normal Rainfall and Total Rainfall at Selected Centres in Sangli District During 1975	51
3.3	Land Use Pattern in Sangli District	54
3.4	Irrigated Area under Different Sources in Different Periods (Sangli District)	57
3.5	Cooperative Lift Irrigation Organisations in Sangli District (1974)	58
3.6	Intensity of Irrigation under Different Sources in Study Area for Pre-modernisation and Modernisation Periods	60
3.7	Variations in Area under Different Crops During the Years 1964-65, 1969-70 and 1973-74 (Sangli District)	61
3.8	Variations in Area under Different Crops in the <u>Study Area</u> in Pre-modernisation and Modernisation Period	63

(vi)

<u>Table No.</u>		<u>Page</u>
3.9	Scope and Coverage of the Intensive Cultivation Schemes in Sangli District	65
3.10	Seed Production of High Yielding Varieties of Foodgrains in Study Area	66
3.11	Package of Inputs and Services under Intensive Cultivation Schemes in Study Area (Modernisation Period)	68
3.12	Area under High Yielding Varieties of Crops in Sangli District (Modernisation Period)	69
3.13	Area under HYV of Crops in Study Area	69
3.14	Number of Tractors and Other Implements Operated with the Help of Tractors (1972-73)	70
3.15	Yield per Acre of Principal Crops in Sangli District	71
3.16	Population and the Classification of Workers in the Sample Villages	77
3.17	Land Use Pattern in the Sample Villages	79
3.18	Lift Irrigation Schemes in Kasabe Digraj	83
3.19	Irrigation Potentials and Utilisation	84
3.20	Lift Irrigation Schemes in Aitwade Khurd (1975-76)	85
3.21	Sources of Irrigation in Nimani	87
3.22	Lift Irrigation Schemes in Nimani	87
3.23	Progress of Kasabe Digraj Vividha Karyakari Society Limited	89
3.24	Dudhondi Vividha Karyakari Sahakari Society	92
3.25	Progress of the Aitwade Khurd Vividha Karyakari Sahakari Society Limited	93

<u>Table No.</u>		<u>Page</u>
3.26	Progress of Nimani Vividha Karyakari Sahakari Society	94
3.27	Performance of Ozarde Vividha Karyakari Sahakari Society	95
3.28	Extent of Modernisation of Agriculture in the Sample Villages	96
4.1	Total and Net Area Owned by the Sample Farmers	102
4.2	Composition of Operational Holdings of the Sample Farmers	103
4.3	Size Groupwise Number of Sample Farms, Households and their Area Selected for the Study	104
4.4	Fragmentation of the Land	105
4.5	Characteristics of the Fragments According to the Size of O.H.	107
4.6	Area under Different Farm Situations According to Size of O.H.	108
4.7	Extent of Fragmentation of the Sample Farm Holdings under Different FSS	109
4.8	Particulars of Net Sown Area, Double Cropped Area and Gross Cropped Area for the Selected Farms	111
4.9	Size Groupwise Distribution of Net Sown Area, Double Cropped Area and Gross Cropped Area for the Selected Farms (Percentage to Sample Total)	113
4.10	Composition of the Sample Farm Families into Men, Women and Children According to Size of O.H.	114
4.11	Average Number of Men, Women and Children per Family According to Size Group of O.H.	115

<u>Table No.</u>		<u>Page</u>
4.12	Average Number of Men and Women per Farm Holding and per Acre According to Size Group of O.H.	116
4.13	Social Status of the Sample Farmers According to Size of Holdings	117
4.14	Average Number of Adults in Family per Holding per Acre in Different Occupations According to Size of Holdings	119
4.15	Employment (Man Days) of the Family Members in Agricultural and Agro-based Activities According to the Size of Operational Holdings	122
4.16	Employment of Casual Labour on Farms in Man Days for Production of All Crops .	123
4.17	Number of Permanent Servants Employed by Size Groups	124
4.18	Employment of Permanent Servants in Crop Production Activities on the Farm and Agro-based Activities (Man Days)	125
4.19	Net Double and Gross Irrigated Area of the Sample Farms According to Size of Operational Holdings	127
4.20	Percentage Distribution of Gross Irrigated Area under Different Sources to Gross Irrigated Area of the Sample Farms According to Size of O.H.	128
4.21	Present Value of Farm Assets Owned by the Sample Farmers According to the Size of O.H.	131
4.22	Value of Asset per Farm Holding and per Acre According to Size of Holdings	132

<u>Table No.</u>		<u>Page</u>
4.23	Percentage Distribution of Value of Assets to Total Value Excluding the Value of Land	133
4.24	Number of Bullock Pairs Owned by Sample Farmers According to Size of H.	134
4.25	Size Groupwise Quantum of Debt Burden and its per Acre Incidence	136
4.26	Agencywise Information about the Incidence of the Total Debt According to Size of Holdings	140
5.1	Cropping Pattern of the Sample Farms into Local and HYV of Foodgrains and Commercial Crops According to Size of Farm Holdings	146
5.2	Cropping Pattern of the Sample Farms into Local and HYV of Foodgrains and Commercial Crops under Different FSs	150
5.3	Cropping Pattern According to Kharif, Rabi and the Perennial Seasons (Percentage Distribution of Total Cropped Area)	152
5.4	Area Irrigated under Different Sources	155
5.5	Extent of Local and HYV of Foodgrains and Commercial Crops under Different Sources of Irrigation (Percentage of Total Irrigated Area)	157
5.6	Choice of Major Crops by the Farmers in Order of Preference According to Size of the Farm Holdings	164
5.7	Choice of Major Crops by the Sample Farmers in Order of Preference under Different FSs	165
5.8	Percentage Distribution of Local and HYV of Foodgrains and Commercial Crops under Different FSs According to Size of the Farm Holdings	168

(x)

<u>Table No.</u>		<u>Page</u>
5.9	Combination of Competing Crops under FS-I and FS-II	171
6.1	Sizewise per Acre Gross Output, Cost and Productivity of the Crops (All Crops)	173
6.2	Sizewise Breakup of per Acre Cost of Labour, Material and Tractor Inputs on the Sample Farms	175
6.3	Sizewise Breakup of per Acre Cost of Inputs (in Percentage Distribution of Each Cost of Input to Total Inputs Costs)	177
6.4	Inputs Use Efficiency : Labour, Material, Tractor and Total Cash Expenditure of Producing One Hundred Rupees Worth of Gross Output According to Size	178
6.5	Situationwise per Acre Gross Output, Cost and Productivity of All Crops	179
6.6	Intensity of Cropping under Different FSs	183
6.7	Situationwise Breakup of per Acre Cost of Labour, Material and Tractor Inputs on the Sample Farms	184
6.8	Relative Importance of Each Input Cost as Percentage Distribution to per Acre Total Cost of Inputs under Different FSs	186
6.9	Situationwise per Acre Cost of Material Inputs of the Sample Farms	187
6.10	Inputs Use Efficiency : Labour Material, Tractor and Total Cash Expenditure of Producing One Hundred Rupees Worth of Gross Output According to FS	190

<u>Table No.</u>		<u>Page</u>
6.11	Size and Situationwise per Acre Gross Output, Cost of Inputs and Productivity	192
6.12	Size and Situationwise Breakup of per Acre Labour, Material and Tractor Input Costs on the Sample Farms	195
7.1	Sizewise Performance of Major Crops of Local and Hybrid Jowar	203
7.2	Reasons for Putting Larger Area under Hybrid Jowar	206
7.3	Reasons for Not Putting Larger Area under Local Jowar	207
7.4	Sizewise Breakup of per Acre Cost of Inputs (Labour, Material and Tractor) for Local and Hybrid Jowar	209
7.5	Use of Material Inputs for Local and Hybrid Jowar (in Cash Expenditure per Acre)	212
7.6	Situationwise Performance of Major Crop of Local and HYV Jowar	214
7.7	Situationwise Breakup of per Acre Cost of Inputs for Local and Hybrid Jowar	215
7.8	Use of Material Inputs for Local and Hybrid Jowar (per Acre Cash Expenditure in Rs.)	218
7.9	Efficiency of Inputs Use in Terms of Cash Expenditure for Producing Output Worth Rs.100 - Local and Hybrid Jowar (According to Size of Farm Holdings)	220
7.10	Efficiency of Inputs Use in Terms of Cash Expenditure for Producing Output Worth Rs.100 (Under Different FSs) - Local and Hybrid Jowar	223

<u>Table No.</u>		<u>Page</u>
7.11	Sizewise Performance of Major Crops - Local and HYV Wheat	225
7.12	Sizewise Breakup of per Acre Cost of Inputs (Labour Material and Tractor Inputs) for Local and HYV Wheat	228
7.13	Use of Material Inputs for Local and HYV Wheat in Term of per Acre Cash Expenditure (According to Size of Holdings)	229
7.14	Efficiency of Inputs Use in Terms of Cash Expenditure for Producing Out- put Worth Rs.100 - Wheat (According to Size of the Holdings)	231
7.15	Situationwise Performance of Major Crops - Local and HYV Wheat	233
7.16	Situationwise Breakup of per Acre Cost of Inputs for Local and HYV Wheat	235
7.17	Use of Material Inputs for Local and HYV Wheat under FSS in per Acre Cash Expenditure	236
7.18	Efficiency of Inputs Use in Terms of Cash Expenditure for Producing Out- put Worth Rs.100 - Local and HYV Wheat	238
7.19	Output, Cost and Productivity of Suru Sugarcane According to Size of Oper- ational Holdings	241
7.20	Per Acre Cost of Human, Bullock, Tractor and Material Inputs According to Size of the Farm Holdings - Sugar- cane Suru	243
7.21	Use of Material Inputs (per Acre in Rs.) According to Size of Farm Holding - Suru Sugarcane	245

<u>Table No.</u>		<u>Page</u>
7.22	Efficiency of Inputs in Terms of Cash Expenditure for Producing One Metric Tonne of Sugarcane According to Different Sizes of Farm Holding	246
7.23	Output, Cost and Productivity of Suru Sugarcane under Different FSs	248
7.24	Per Acre Cost of Human, Bullock, Tractor and Material Input under Different FSs (Suru Sugarcane)	250
7.25	Per Acre Cost of Material Inputs under Different FSs - Suru Sugarcane	250
7.26	Efficiency of Inputs in Terms of Cash Expenditure for Producing One Metric Tonne of Sugarcane under Different FSs	252
7.27	Devices of Lifting Water and Irrigation Charges under FS-II	255
7.28	Value of Output of Suru Sugarcane and Other Competing Crops for per Rupee Expenditure on Irrigation	256
7.29	Surplus of Net Output Over Total Costs - per Acre (Rs.) in the Production of Suru Sugarcane and Other Competing Crops Combination	258
8.1	Size and Magnitude of the Yield Gap for Some Major HYV Crops under Different Farm Size and FSs	267
8.2	Level of the Use of Main Inputs by the Sample Farmers under Different Farm Conditions - Crop - Hybrid Jowar	272
8.3	Level of the Use of Main Inputs by the Farmers under Different Farm Conditions - Crop - HYV Wheat	273

<u>Table No.</u>		<u>Page</u>
8.4	Level of the Use of Main Inputs by the Farmers under Different Farm Conditions - Crop - Suru Sugarcane	277
8.5	Reasons for not Using the Recommended Quantity of Inputs (Particularly Fertilisers) for Sugarcane	278
8.6	Water Use by Sugarcane Growers	278
8.7	Identification of Economic Constraints to HYV Crops	280
8.8	Identification of Biological Constraints to Major Crops Taken by the Sample Farmers	282
8.9	Biological Constraints to the Major HYV Crops under Different Farm Sizes and FSs	283