

AN ANALYSIS OF REGIONAL DISPARITIES IN
AGRICULTURAL GROWTH IN MADHYA PRADESH

THESIS

Submitted to the
Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur
in partial fulfilment of the requirements
for the Degree of

DOCTOR OF PHILOSOPHY

IN

AGRICULTURE

(AGRICULTURAL ECONOMICS AND FARM MANAGEMENT)

By

NAND LAL

DEPARTMENT OF AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

JAWAHARLAL NEHRU KRISHI VISHWA VIDYALAYA

COLLEGE OF AGRICULTURE

JABALPUR (M. P.)

1988

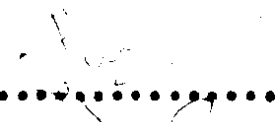
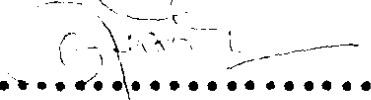
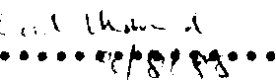
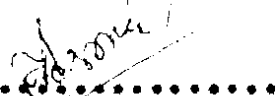
CERTIFICATE-I

This is to certify that the thesis entitled "AN ANALYSIS OF REGIONAL DISPARITIES IN AGRICULTURAL GROWTH IN MADHYA PRADESH" submitted in partial fulfilment of the requirements for the degree of "DOCTOR OF PHILOSOPHY" of the Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, is a record of the bona fide research work carried out by Shri N.L. Idnani under my guidance and supervision. The subject of the thesis has been approved by the Student's Advisory Committee and the Director of Instructions.

No part of the thesis has been submitted for any other degree or diploma (certificate awarded etc.) or has been published/published part has been fully acknowledged. All the assistance and help received during the course of the investigations have been duly acknowledged by him.


Chairman of the Advisory Committee

THESIS APPROVED BY THE STUDENT'S ADVISORY COMMITTEE

Chairman	(Dr. R.S. Mishra) 
Member	(Dr. S.S. Gour) 
Member	(Dr. Lalchand) 
Member	(Dr. Y.C. Sanoria) 

CERTIFICATE-II

This is to certify that the thesis entitled "AN ANALYSIS OF REGIONAL DISPARITIES IN AGRICULTURAL GROWTH IN MADHYA PRADESH" submitted by Shri N.L. Idnani to the J.N. Krishi Vishwa Vidyalaya, Jabalpur in partial fulfilment of the requirements for the degree of Ph.D. in the Department of AGRICULTURAL ECONOMICS AND FARM MANAGEMENT, has been approved by the Student's Advisory Committee and External Examiner(s) after an oral examination on the same.

External Examiner

Major Advisor

Head of Department

Director of Instructions

ACKNOWLEDGEMENTS

At the outset, I am grateful to MAA SHARDA who has bestowed on me the courage to take the stupendous task and kept me away from worries during research work.

I express my deep sense of gratitude to Dr. R.S. Mishra, Professor and Head Department of Agricultural Economics and Farm Management, J.N. Krishi Vishwa Vidyalaya, Jabalpur, and Chairman of my advisory committee, for giving me an opportunity to work under his guidance, and whose valuable guidance, sustained interest and encouragement made this research possible.

I am equally indebted to the members of my advisory committee - Dr. S.S. Gour, Professor (Deptt. of Agricultural Economics & Farm Management, JNKVV), Dr. Lalchand, Professor (Prof. & Head Department of Statistics, JNKVV), and Dr. Y.C. Sanoria, Professor (Department of Extension Education, JNKVV).

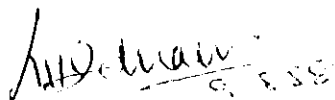
I humbly extend my thanks to my respected teachers Dr. S.P. Pant, Dr. B.L. Mishra, Dr. A. Seshagiri, Dr. S.K. Dubey, Shri N.P. Katiyar, who had ever been helping me during the course of study.

I am grateful to Dean, College of Agriculture, Jabalpur, and Director of Instruction, JNKVV, Jabalpur, for the approval of thesis and giving me encouragement during the course of investigation.

My heart-felt thanks go to my all friends and colleagues who helped me in various ways, especially to Dr. S.V. Karanjkar, S/Shri D.K. Marothia, S.K. Sharma, N.P. Katiyar, M.C. Athavale and V.N. Rajput.

I take this opportunity to convey my deepest sense of gratitude and venerable regards to my mother, my wife, my daughters for their encouragement, affection and precious time which have always been a beacon light to me in all the undertakings.

I am thankful to Mr. John Embross for computer analysis and Mr. K.G.K. Nair for timely completion of typing work.


(N.L. Idnani)

Jabalpur

Dated: 9. 8. 88

TABLE OF CONTENTS

<u>Chapter</u>		<u>Page</u>
I	INTRODUCTION.....	1
	Objectives.....	6
	Hypothesis.....	7
	Limitations of study.....	7
II	REVIEW OF LITERATURE.....	8
	2.1 Studies on estimation of agril. growth...	8
	2.2 Studies on regional disparities in agril. growth.....	27
	2.3 Summary comments on the studies reviewed.	34
III	METHODOLOGY.....	36
	3.1 Area under study.....	36
	3.2 Study period and nature of data.....	38
	3.3 Specification of variable.....	39
	3.4 Analytical framework.....	41
IV	REGIONAL STRUCTURE OF AGRICULTURE IN MADHYA PRADESH.....	45
	4.1 Soil type.....	49
	4.2 Rainfall.....	50
	4.3 Regional land use pattern.....	52
	4.4 Regional distribution of holdings.....	55
	4.5 Cropping pattern.....	59
	4.6 Irrigation.....	64
	4.7 Coverage of high yielding varieties.....	71

<u>Chapter</u>	<u>Page</u>
4.8 Fertilizer consumption.....	73
4.9 Agricultural work force.....	77
V RESULTS AND DISCUSSION.....	80
A. Averages of variables regionwise.....	80
Regional disparities of area, production and productivity of important crops and factors affecting the agricultural growth in the state.....	123
B. Absolute and relative changes in area, production and productivity for important crops and factors affecting the agricultu- ral growth in all regions and in state....	141
C. Coefficient of variation over period in variables.....	167
D. Regional linear trend in area, production and productivity of major crops of the state.....	185
E. Compound growth rate.....	203
F. Correlation coefficient of factors causing regional disparities.....	220
G. Multiple correlation coefficient of area, production and productivity of important crops with causal factors.....	223
H. Multiple regression analysis.....	225
VI SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS..	228
BIBLIOGRAPHY.....	265
APPENDICES.....	273
VITA.....	277

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
4.1	Crop zones, agro-climatic regions and soils of Madhya Pradesh.....	48
4.2	Regional average rainfall in mm.....	51
4.3	Regional land use pattern in Madhya Pradesh....	53
4.4	Regional distribution of holdings.....	57
4.5	Seasonal percentage distribution of cropped area in agro-climatic regions.....	60
4.6	Regional coverage of area under important crops aggregates in Madhya Pradesh.....	63
4.7	Regional irrigated area in Madhya Pradesh.....	65
4.8	Regional irrigated area under crop aggregate in Madhya Pradesh.....	67
4.9	Regional source-wise number and irrigated area in Madhya Pradesh.....	69
4.10	Percentage area under high yielding varieties coverage in agro-climatic regions of M.P.....	72
4.11	Region and season-wise fertilizer consumption in Madhya Pradesh.....	74
4.12	Use of fertilizer per unit of cropped area in Madhya Pradesh.....	76
4.13	Regionwise agricultural work force.....	78
1A	Average of area production and productivity of important crops in Chhatisgarh Plain region during post-technological period.....	82
1B	Average of selected factors for agricultural Development in Chhatisgarh Plain region.....	83
2A	Average of area, production and productivity of important crops in Bastar plateau region.....	85
2B	Average of selected factors for agricultural development in Bastar plateau region.....	86

<u>Table</u>	<u>Title</u>	<u>Page</u>
3A	Average of area, production and productivity of important crops in Northern Hills of Chhatisgarh region during post-technological period...	88
3B	Average of selected factors for agricultural development for Northern hills of Chhatisgarh region.....	89
4A	Average of area, production and productivity of important crops in Kymore Plateau and Satpura Hills region during post-technological period..	92
4B	Average of selected factors for agricultural development for Kymore plateau and Satpura hills region.....	93
5A	Average of area, production and productivity of important crops in Vindhyan plateau region during post-technological period.....	95
5B	Average of selected factors for agricultural development in Vindhyan plateau region.....	96
6A	Average of area, production and productivity of important crops in Central Narmada Valley region during post-technological period.....	98
6B	Average of selected factors for agricultural development in Central Narmada Valley.....	99
7A	Average of area, production and productivity of important crops in Gird region during post-technological period.....	101
7B	Average of selected factors for agricultural development in Gird region.....	102
8A	Average of area, production and productivity of important crops in Bundelkhand region during post-technological period.....	104
8B	Average of selected factors for agricultural development in Bundelkhand region.....	105
9A	Average of area, production and productivity of important crops in Satpura plateau during post-technological period.....	107
9B	Average of selected factors for agricultural development in Satpura plateau region.....	108

<u>Table</u>	<u>Title</u>	<u>Page</u>
10A	Average of area, production and productivity of important crops in Malwa plateau region during post-technological period.....	111
10B	Average of selected factors for agricultural development in Malwa plateau region.....	112
11A	Average of area, production and productivity of important crops in Nimar valley region during post-technological period.....	114
11B	Average of selected factors for agricultural development in Nimar valley region.....	115
12A	Average of area, production and productivity of important crops in Jhabua region during post-technological period.....	118
12B	Average of selected factors for agricultural development in Jhabua hills region.....	119
13A	Average of area, production and productivity of important crops in Madhya Pradesh state during post-technological period.....	121
13B	Average of selected factors for agricultural development for post-technological period in Madhya Pradesh State.....	122
14	Regional disparities in percentage share of area, production and productivity of important cereal crops in Madhya Pradesh.....	124
15	Regional disparities in percentage share of area, production and productivity of important pulse crops in Madhya Pradesh.....	129
16	Regional disparities in percentage share of area, production and productivity of important oilseed and commercial crops in Madhya Pradesh.	132
17	Average of important factors affecting the agricultural growth in Madhya Pradesh.....	136
18.	Absolute and relative change in averages on area of crops in all the regions of Madhya Pradesh.....	142-144

<u>Table</u>	<u>Title</u>	<u>Page</u>
19	Absolute and relative changes in averages on crop production in all the regions of Madhya Pradesh.....	150-152
20	Absolute and relative changes in average of crop productivity in all the regions of Madhya Pradesh.....	155-156
21	Absolute and relative changes in important factors affecting the agricultural growth in Madhya Pradesh.....	160-161
22	Regional coefficient of variation of area, production and productivity of important cereal crops in Madhya Pradesh.....	170
23	Regional coefficient of variation of area, production and productivity of important pulse crops in Madhya Pradesh.....	173
24	Regional coefficient of variation of area, production and productivity of important oilseed and commercial crops in Madhya Pradesh.....	176
25	Coefficient of variation of factors affecting agricultural growth in all the regions of Madhya Pradesh.....	179
26	Regional linear trend in area of important crops/crop groups in Madhya Pradesh.....	187
27	Regional linear trend in production of important crops/crop groups in Madhya Pradesh.....	191
28	Regional linear trend in productivity of important crops/crop groups in Madhya Pradesh.....	196
29	Regional linear trend in important factors affecting the agricultural growth.....	199
30	Regional compound growth rate of area, production and productivity of cereal crops in Madhya Pradesh.....	204

<u>Table</u>	<u>Title</u>	<u>Page</u>
31	Regional compound growth rates of area, production and productivity of pulse crops in Madhya Pradesh.....	208
32	Regional compound growth rates of area, production and productivity of oilseed and commercial crops in Madhya Pradesh.....	212
33	Regional compound growth rates of factors affecting the agricultural growth.....	216
34	Correlation coefficient between the regional growth rates of area, production, productivity and the causal factors.....	222
35.	Multiple correlation of area, production and productivity with causal factors in the state.	224
36	Multiple linear regression equations of important crops for their production and causal factors in the state.....	226

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>	<u>Pages in between</u>
1.	Map of Agro-climatic regions of Madhya Pradesh.....	48-49
2.	Map of soil types of Madhya Pradesh....	49-50

LIST OF APPENDICES

<u>Appendix</u>	<u>Title</u>	<u>Page</u>
I	Coefficient of variation of area, production and productivity of important cereal crops.....	273
II	Coefficient of variation of area, production and productivity of important pulse crops.....	274
III	Coefficient of variation of area, production and productivity of important oilseed and commercial crops.....	275
IV	Coefficient of variation of factors affecting the agricultural growth in all the regions of Madhya Pradesh.....	276

LIST OF ABBREVIATIONS

TFG	--	Total foodgrains
TC	--	Total cereals
RIC	--	Rice
WHT	--	wheat
JOW	--	Jowar
KK	--	Kodo-Kutki
TP	--	Total pulses
BGM	--	Gram
RGM	--	Arhar
BKGM	--	Urid
TE	--	Teora
MSR	--	Lentil
TOS	--	Total oilseeds
MTD	--	Mustard
SBW	--	Soybean
SESA	--	Sesamum
LNSD	--	Linseed
GNUT	--	Groundnut
SUGR	--	Sugarcane
COT	--	Cotton
NCA	--	Net area sown
TCA	--	Total cropped area
NIA	--	Net irrigated area
TIA	--	Total irrigated area
RIC Ir	--	Rice irrigated area

WHT Ir	--	Wheat irrigated area
TC Ir	--	Total cereal irrigated area
TP Ir	--	Total pulses irrigated area
TOS Ir	--	Total oilseeds irrigated area
SUGR Ir	--	Sugarcane irrigated area
COT Ir	--	Cotton irrigated area
TOT Hy	--	Total high yielding varieties area
RIC Hy	--	Rice high yielding varieties
WHT Hy	--	Wheat high yielding varieties
JOW Hy	--	Jowar high yielding varieties
FERT C	--	Fertilizer consumption