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CONTENTS

Sr. No.	TITLE & NAME OF THE AUTHOR (S)	Page No.
1.	A STUDY ON THE JOB SATISFACTION OF THE EMPLOYEES OF BPO SECTOR <i>V. SAVITHA & DR. E. VIJILA</i>	1
2.	A PRODUCTIVE ANALYSIS OF REGIONAL INEQUALITY IN AGRICULTURAL DEVELOPMENT: STUDY OF HARYANA INTER-DISTRICT EMPIRIC <i>DR. INDERJIT</i>	5
3.	THE STUDY OF KEY SUCCESS FACTORS IN NEW PRODUCT DEVELOPMENT PROCESS IN TEXTILE INDUSTRY WITH SPECIAL REFERENCE TO SURAT REGION <i>RASHVIN TAILOR & DR. MANISHA PANWALA</i>	9
4.	AN EMPIRICAL STUDY ON MARKETING INFORMATION SYSTEM <i>DEEPAK S & DR. S. J. MANJUNATH</i>	12
5.	MOMPREENURSHIP: A NEW TREND OF ENTREPRENEURSHIP <i>B. N. LALITHCHANDRA & T. LAVANYA KUMARI</i>	16
6.	RELATIONSHIP BETWEEN JOB SATISFACTION AND OTHER PSYCHOSOCIAL VARIABLES: A COMPARATIVE STUDY OF MALE AND FEMALE EMPLOYEES OF BUSINESS PROCESSING OUTSOURCING (BPO) SECTOR <i>PRIYANKAR SINGHA & DR. SOUVIK RAYCHAUDHURI</i>	20
7.	YOGA AND MEDICAL SCIENCE <i>PRADEEP H. TAWADE</i>	24
8.	A STUDY ON AN ANALYSIS OF SHORT-TERM LIQUIDITY POSITION OF TATA STEEL LIMITED <i>R. SATHISHKUMAR</i>	26
9.	RULES AND VALUES OF CO-OPERATIVE BANKS <i>DR. SAKSHI TEWARI</i>	30
10.	CUSTOMERS BUYING BEHAVIOUR IN ASHOK LEYLAND, CHENNAI <i>DR. R. AMUDHA & K. SRILAKSHMI</i>	34
11.	IMPACT OF ENGLISH INVASION ON INDIAN CULTURE <i>SANGEETHA. J</i>	39
12.	BEST PRACTICES FOR ENHANCING USE OF LIBRARY COLLECTION AND OTHER LIBRARY SERVICES <i>AJIT VASANTRAO JANUGADE</i>	41
13.	ENTREPRENEURSHIP DEVELOPMENT EFFORTS AND THE CHALLENGE OF QUALITY EDUCATION AND HUMAN RESOURCE DEVELOPMENT IN NIGERIA <i>DR. S.O. ONIMOLE</i>	44
14.	FACTORS INFLUENCING THE DECISION OF ADOPTING COMPUTERIZED ACCOUNTING SYSTEM (CAS) BY SMALL AND MEDIUM ENTERPRISES (SMEs) IN KURUNEGALA URBAN AREA IN SRI LANKA <i>PATHMINI MGS & KARUNADASA MKGPSK</i>	49
15.	ASSESSMENT OF CUSTOMERS' ATTITUDE AND BANKS' GROWTH TOWARDS E- BANKING IN NIGERIA <i>FAITH ERINMA ONYEBUENYI</i>	55
16.	IMPLEMENTATION MECHANISM OF MGNREGA IN HIMACHAL PRADESH <i>KHEM RAJ</i>	60
17.	EFFECTS OF FDI IN RETAIL SECTOR IN INDIA <i>NAZEEFA BEGUM MAKANDAR</i>	67
18.	AN ANALYSIS OF SERVQUAL AND SERVPERF IN INDIAN BANKING CONTEXT <i>SUDESHNA DUTTA</i>	72
19.	EFFECT OF MOBILE PHONES ON HUMAN BODY <i>SUNIL KUMAR TRIVEDI</i>	78
20.	SELF EFFICACY AND OTHER PERSONAL RESOURCES AS ANTECEDENTS OF EMPLOYEE ENGAGEMENT: A CRITICAL LITERATURE REVIEW <i>HARSH VARDHAN KOTHARI</i>	82
	REQUEST FOR FEEDBACK & DISCLAIMER	88

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A PRODUCTIVE ANALYSIS OF REGIONAL INEQUALITY IN AGRICULTURAL DEVELOPMENT: STUDY OF HARYANA INTER-DISTRICT EMPIRIC

**DR. INDERJIT
PRINCIPAL
GOVERNMENT COLLEGE OF WOMEN
REWARI**

ABSTRACT

Agriculture is the most important sector of Indian economy, the pace of economic growth and wellbeing of general masses are still significantly influenced by the pace of agricultural development. But, like other sectors of Indian economy agricultural development is also marred by huge regional inequalities. Inequality in agriculture is not only present in between states but inequality is also a matter of serious concern with in state. Haryana which is considered as 'Super-Power' in terms of agricultural development is also not an exception of above mentioned trends. Present study attempts to reveals the present scenario of agricultural development in Haryana; while attempting to study the trends of regional disparities in one of most agriculturally developed state of India in selected time periods, study also test the applicability of certain developmental hypotheses in the case of agricultural development of Haryana. This paper has been divided into three different but cohesive sections. Section I deals with the issues and literature related to regional inequalities. Section II focuses on core characteristics of study-area and methodology of the present study. And the last section briefly analyse the levels of agricultural development of Haryana over three specific time periods (i.e. 1990-92, 2000-2002 and 2007-09) by employing deprivation index.

KEYWORDS

agricultural development, deprivation index, ranking method, triennial averages, convergence and divergence of development.

INTRODUCTION

Development is a process of changing and aiming the socio-economic transformation of a traditional society into a modern society. The concept of development has been interpreted in many ways by Politicians, economists, planners and researchers depending on their perception and objectives. But all of them agree with the idea that development means improvement in the standard of living of people (World Bank, 1975). World over, different economies drive their economic growth and development through different sectors. Some economies are dependent on agriculture, while some are known as industrial economies and some are knowledge based economies. And all these economies have the supreme goal of economic growth, development and general equity in society. But as many researchers and economists (i.e. Myrdal (1957); Hirschman (1961), have proved many times that development is not a location neutral phenomenon, it tends to differ from one location to other in its intensity and in its characteristics. Owing to some historical, natural, economical, geographical and even because of political factors development tends to 'Diverge' at least in the initial stages in all the countries.

Inequalities in development have always remained the core issue in all development related studies. Studies by Myrdal (1957), Hirschman (1961), and many others have proved that development do not take place with the same intensity on all the locations. And in development due to 'Backwash Effect' all economic activities tend to concentrate at some points and leading to the formulation of development of 'Growth Foci'. Although this trend gets reversed once 'Spread effect' get starts in long run. In counties like India, where the process of development is relatively new or has just began divergence of inequalities are more evident. This shows that, in the initial stages of development regional inequalities in various sectors of economy will be on the high (Kumar, 2009).

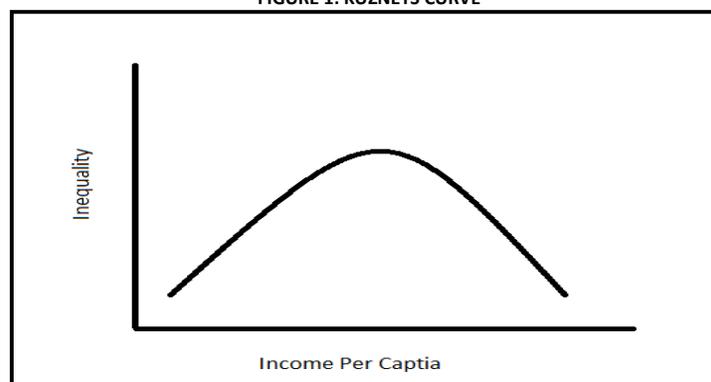
In Indian case, inequalities in the levels of development between different regions have been an integral feature of the history of economic development. Uneven development is quite evident in all the sectors of the economy where co-existence of developed and backward regions has led to dichotomous situation. Questions regarding the regional disparities are not new in development related literature and it has been recognised in policy papers and in implementation. The approach paper of 11th five-year plan adopted in 2006, forcefully articulates the urgency in the 'Convergence of Development' as:

*"The strategy of inclusive growth proposed in this paper can command broad based support only if growth is seen to demonstrably bridge divides and avoid exclusion or marginalisation of large segments of our population. These divides manifest themselves in various forms between the have and have-nots; between rural and urban areas; between the employed and under-employed; between different states, districts and communities and finally between genders."*¹

The discussion related to regional disparities in development came into lime light after the publication of Kuznets (1955) study. This study presented a diagrammatic representation of relationship between development and inequalities by what is known today as 'Kuznets Curve' (Figure 1). This curve relates economic development with regional inequalities predicting that during the initial stages of development, inequalities in all the sectors will increase, which is also confirmed by Indian development history. In development related studies this curve is also known as 'Invert U Curve' (Dubey, 2009).

When it comes to agricultural sector of Indian economy which provides 17.5 % of GDP and 60-70% direct and indirect employment to Indian masses is also not an exception to regional inequalities. In agriculture sector also disparities in and among states is alarmingly high. Many studies (i.e. Dubey, 2009; Kumar, 2009; Kumar, 2009a) have highlighted that as regional disparities are prevalent in agricultural development also as they are present in other sectors of Indian economy. In case of Haryana, which is agriculturally most developed state of India, is also marred by severe inequalities in development especially in terms of agricultural development. Present paper is an attempt to assess how agricultural disparities in Haryana have behaved over selected time period (i.e. 1990-92, 2000-2002 and 2007-09). This study is also throws light on how regional disparities have moved with the implementation of new economic reforms and thereafter.

FIGURE 1: KUZNETS CURVE



Source: Dubey (2009)

HYPOTHESES RELATED TO DISPARITIES IN DEVELOPMENT

Given the long history of economic planning, awareness related to regional disparities was very high among researchers. During process of development the forces of convergence and divergence act together and the ultimate result depends on the relative strength of these opposite forces (Swanin et al., 2009). The convergence forces are cherished as spread (Myrdal, 1957) and trickling down (Hirschman, 1961) effects of development efforts that help reducing disparities. The divergence factors that widen regional disparity are termed as backwash (Myrdal, 1958) and Polarisation effects (Hirschman, 1961). A close scrutiny of existing literature on regional disparity reveals that there are at least three different hypotheses with differing emphasis given to the relative importance over time of the forces of convergence and of divergence.

Huges (1961) proposed that the forces of divergence dominate over those of convergence and as a result, inter-regional differences in the levels of economic development keep on widening over time. In second view, Hanna (1959) viewed that the rate of economic growth is inversely related to the level of per capita income and hence given identical technologies, preferences and rate of population growth, difference in per capita incomes between any two regions will be short-lived. Third hypothesis, which can be seen as the optimal combination of above two was given by Williamson (1963) pointed out that inter-regional disparities, diverge initially to converge later on and thus, trace out the famous 'Kuznetsian Invert U Curve' over time in the process of national economic development (Nair, 2003).

In the light of above hypotheses, the study attempts to analyse the process of regional disparities in the levels of agricultural development in Haryana over a specific time period covering reform and post-liberalisation period. Study attempts to examine whether disparities are converging or diverging under market forces.

REVIEW OF LITERATURE

Since the problem of regional manifestation of development of an economy is not new, interest in the thoughts and patterns of regional disparities are also not new. The general idea about the process of development and its relation with disparities was given by Thunen (1826), Webber (1909) and Losh (1940) through their various location models. But, the real theory formation concerning regional disparities started by the works of Myrdal (1957) and Hirschman (1961) as they gave 'Spread effect and Backwash effect' and 'Trickling down of Polarisation effects' respectively.

In studies concerning India and Indian states, pioneering work has been done by M.N Pal (1968), Kundu (1980), and many others. Their work has shown and proved that how regional disparities behave under different socio-economic conditions of different states. In terms of disparities in agricultural development of India earliest work is of Sharma (1958) who did pioneering work in identifying levels of agricultural development by using general survey from 1947-1957. Apart from him Mathur (1983); Manjit and Mitra (1996); Dasgupta et al. (1997); Ghose et al. (1998); Mukherjee (2004); Ruksana (2009) have also highlighted the issues related to regional disparities in various sectors of Indian economy.

The review of literature reveals that regional disparities are very important in development studies and can provide deep insight for future course of development. Present study is an attempt to identify regional disparities in agricultural of Haryana over selected time period so that regional harmonious development can be achieved which is also over developmental goal.

CONCEPT OF AGRICULTURAL DEVELOPMENT

In last few decades there have been numerous studies on agricultural development all over the country in various academic disciplines. But most studies skip any pin-pointed definition of agricultural development. Nath (1960), Bhalla and Tyagi (1989) all of them have equated agricultural development with productivity of agriculture. Raza (1978) took most comprehensive view of agricultural development by recognising four dimensions i.e. Productivity, Production conditions, Agrarian relations and Agricultural change. Many others (i.e. Krishan, 1980) believe that agricultural development may be envisaged as the agricultural performance of an area in terms of economic gains of yield, social justice it delivers. For a common frame of references in present study agricultural development connotes 'qualitative and quantitative' upward shift in the performance of agriculture and leading to general well-being among farming community. For analysing these qualitative and quantitative changes over time, 10 Indicators of agricultural development have been selected for analysis.

OBJECTIVES OF THE STUDY

Main objectives of present study are:

1. To test various development hypotheses in case of agricultural development in Haryana.
2. To measure the extent of regional disparities in agricultural development of Haryana.
3. To explain how agricultural disparities have behaved over time.
4. To explain that how regional disparities have behaved under market force after liberalisation of Indian economy.

DATABASE AND METHODOLOGY

STUDY AREA

Haryana with its favourable climatic and topographical characteristics is agriculturally most developed state of India. Haryana lies between 27° 39' and 30° 55' North latitude and 74° 27' and 77° 36' East longitude, with a geographical area of 44212 Sq Km. Given the rich fertile soil, proper irrigation facilities and location near a huge market are primary factors that have led to well-developed agriculture in Haryana. Agriculture plays an important role in socio-economic development of the state. Statistics reveals that around 80% of states geographical area is under cultivation Haryana occupies prominent place among the top producers of wheat, rice and other agricultural products. Soon after the formation of Haryana in 1966, government of Haryana gave emphasis on the development of agriculture and as a result Haryana has achieved pioneering position in India especially in terms of agricultural development. But, as most hypotheses accept this development was not equal for all the districts with in Haryana. There is marked difference between the districts of northern Haryana and southern districts of Haryana. Apart from marked difference in physical climate north and southern districts of Haryana also differs in terms of agricultural development. Districts of north Haryana are technologically highly developed and are more market oriented. Whereas southern districts are still poorly equipped with technology and are still backward in comparison of other districts of Haryana (Kumar, 2009). Moreover, after adaptation of New Economic Policies of liberalisation in 1991, Haryana's economy is exposed to new and diverse challenges from market forces. Therefore, in present study regional disparities in agriculture are studied to bring out regional manifestation of development under market forces.

METHOD

Present study is based on secondary data collected from varied data sources. Statistical Abstract of Haryana for various years, issued by Department of Economics and Statistical Analysis, Government of Haryana has served as chief data source. As development is not a single entity, it is a multi-dimensional phenomenon which is combined effect of many things. In present study agricultural development is assessed by taking into account of 10 development indicators which are directly related to input or output part of agriculture. The levels of agricultural development have been derived by composite **Development Index²** of all variables and mathematically Development index can be written as:

$$Z_{ij} = \frac{(\text{Actual } X_{ij} \text{ Value}) - (\text{Minimum } X_{ij} \text{ value})}{(\text{Maximum } X_{ij} \text{ value}) - (\text{Minimum } X_{ij} \text{ value})}$$

Here,
 Z_{ij} = Composite Deprivation Index
 Actual X_{ij} = Actual Value for Variable
 Maximum X_{ij} = Maximum Value for variable
 Minimum X_{ij} = Minimum Value for variable

The value of the index ranges from 0 to 1. Best performing district would get '1' and worse would get the index value of '0'. Moreover, for measuring the magnitude of regional imbalances in the case of agricultural development across the districts has been calculated by using *Coefficient of Variation*. To depict district wise agricultural development composite agricultural development has been constructed by using following ten indicators.

X ₁	Percentage of area under HYV seeds to gross cropped area;
X ₂	Consumption of fertilizers (Kgs/Hectares);
X ₃	Consumption of Pesticides (kgs/Hectare);
X ₄	Percentage of gross irrigated area under gross cropped area;
X ₅	Number of tractors to per hectare of gross cropped area;
X ₆	Average size of land holding;
X ₇	Percentage of Gross Cropped Area Under Commercial crops to total cropped area;
X ₈	Per hectare gross value of agricultural output in rupees (base year price);
X ₉	Percentage of area sown more than once to net area sown;
X ₁₀	Intensity of Cropping;

Agriculture is a highly dynamic phenomenon; it tends to vary year after year based on climate and many other factors. And in order to tap changing nature of agriculture, three years' triennial average has been taken for analysis. Furthermore, for presenting data tables and diagrams have been used and for showing spatial pattern of agricultural development is shown through various choropleth maps.

This paper has been divided into three different but cohesive sections. Section I deals with the issues and literature related to regional disparities. Section II focuses on core characteristics of study-area and methodology of the present study. And the last section briefly analyse the levels of agricultural development of Haryana over three specific time periods (i.e. 1990-92, 2000-2002 and 2007-09)

RESULTS AND DISCUSSIONS

After employing deprivation index on selected indicators to obtained composite agricultural development index for all the districts; it is evident (table 1) that there exists huge inter-regional as well as inter-district disparities in agricultural development of Haryana. The calculated value of composite indices reveals significant inter-district variations in the levels of development for 1990-92 the value of Coefficient of variation (in %) which was 66.66 % but after the implementation of new economic policies the regional disparities in agricultural development have narrowed down significantly (Coefficient of variation 45.45%). Interestingly contrary to developmental hypotheses disparities started diverging again here for 2007-09, Coefficient of variation stands at 63.82%.

In 1990-92, only 2 districts were under highly developed category those were Karnal and Kurukshetra; medium developed category constitutes 7 districts (around 43.75%) and most of districts of this category are from northern Haryana. But, under low and very low developed categories, interestingly districts of southern and central Haryana falls. This north-south division is a by product of green revolution which started in northern Haryana, and failed to percolate in southern parts (Bishnoi et al., 2008)

For 2000-02, picture was still almost the same here also districts of northern Haryana constitutes high and medium developed category, whereas southern and central districts occupy low and very low category (Map. 2). But in the index for 2007-09, agricultural development has shown a relatively different picture. In 2007-09, index developed category is still occupied by northern districts of Kaithal, Karnal, Panipat and Kurukshetra; but under medium category some new districts have occupied new places which were earlier by Jind and Faridabad; moreover, in this index surprisingly Ambala has slipped to very low category (Map. 3). Index for 2007-09, shows that now with the passage of time agricultural development is trickling down to backward districts of southern Haryana but with snail pace.

After through study of spatial spread of regional disparities in agricultural development, this can be easily concluded that core area for the agricultural development lies in northern districts, whereas southern districts are still lagging behind. Study of related literature shows that this north-south divide of Haryana is partly because of two prime causes. One is the green revolution and other is irrigation facilities. It is well known fact that northern districts of Haryana have served as the focal point for the green revolution and primarily because the initial push from green revolution districts like Karnal, Panipat, Kurukshetra, Kaithal has higher awareness about modern technology and as a result agricultural development is relatively higher here. Secondly the intensity of irrigation facility in north is high. And in states like Haryana with semi-arid climate irrigation facilities holds the key for prosperity. And at the same time spread of technological know-how in technological poor districts of southern Haryana is key to alter the developmental focus from north to southern districts of Haryana

KEY FINDINGS

On the bases of above analyse following key findings can be concluded:

1. The notion that regional disparities decrease with the development is wrong, in the case of agricultural development of Haryana. It seems, as if regional disparities converge or diverge owing to many other factors, other than SIMPLY time taken in development.
2. In terms of agricultural development there is a clear north south division exists. Where northern districts are way ahead as compare to their southern counterparts.
3. It seems as, Green revolution and irrigation facilities are to chief responsive factors in inequalities in agricultural development.

CONCLUSION

The foregoing analysis proves that agricultural development in India's agriculturally most developed state is not inclusive. There is marked inter-district regional disparities between districts of northern and southern Haryana. Green revolution of 1967-68, gave initial thrust to agricultural development in northern districts that's why they are still dominating development scenario in Haryana. Apart from green revolution expansion availability of irrigation has played important role in causing regional disparities. This analyses helps in rejecting a popular hypothesis that regional disparities tend to converge after initial divergence. As this study shows that in Haryana regional disparities in agricultural development have converged from 1990-92 to 2000-02, but after this convergence in 2007-09 divergence have started again. In general, now this can be accepted that no doubt Haryana has achieved high growth rate of economic development but in this there are certain areas to which development process has bypassed. Now need of hour is to harmonise the development by making it more inclusive. Special problem oriented planning should be initiated to expand development to all the horizons. Expansion of irrigation facilities to southern and backward districts is most important in them.

TABLE 1: HARYANA: AGRICULTURAL DEVELOPMENT INDEX (ADI)

Districts	1990-92	2000-02	2007-09
Ambala	0.56	0.36	0.24
Bhiwani	0.20	0.00	0.14
Faridabad	0.48	0.48	0.58
Fatehabad	**	0.62	0.53
Gurgaon	0.30	0.39	0.25
Hisar	0.48	0.55	0.34
Jhajjar	**	0.40	0.00
Jind	0.50	0.50	0.57
Kaithal	0.55	0.58	0.79
Karnal	1.00	1.00	1.00
Kurukshetra	0.82	0.70	0.97
Mahendergarh	0.34	0.31	0.23
Panchkula	**	0.45	0.41
Panipat	0.60	0.68	0.94
Rewari	0.32	0.31	0.26
Rohtak	0.00	0.35	0.19
Sirsa	0.56	0.51	0.49
Sonipat	0.52	0.60	0.68
Yamunanagar	0.60	0.58	0.74
Mean	0.48	0.44	0.49
S.D.	0.32	0.20	0.30
C.V. (In %)	66.66	45.45	60.96

Source: Data is calculated by researcher from Statistical Abstract of Haryana for various years, issued by Department of Economics and Statistical Analysis, Government of Haryana.

Note: **Districts were not in existence.

NOTE

1. Towards Faster and more Inclusive growth: An approach to the Eleventh Five-year plan, Planning Commission, Government of India, 2006, Chapter 5.
2. There are numerous methods for calculating a composite index i.e. summation of ranks, division of mean and so on. The method for calculating the composite index for development by summing the ranks of various indicators has been quite popular among research scholars. The ranking method has two major drawbacks. Firstly, it does not consider the magnitude of difference in values of indicators. Secondly, in this method all the indicators are given equal weights. Analysis based on such considerations may be limited use. Therefore, in present study **Development Index** is used. (Which is widely used in **Human Development Index (HDI)**).

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