



Review Of Literature On Irrigation And Land Use Pattern

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Abstract: A study by Institute of Economic Growth on agricultural diversification has brought out that the share of livestock and fisheries in agriculture has increased overtime (Jha et. al., 2005). During the reference period (1983, 2003 and 2006-07) of the study, there is an increasing trend towards specialisation in agricultural production with a significant increase share of fruits and vegetables in the Gross Cropped Area (GCA). The study specifically focus on agriculture diversification trends in Haryana which are supportive to the diversification trend at the all India level. The micro-level evidences suggest that the certain crops are more remunerative in the given resource endowments and institutional framework. Farms in the region are getting specialized under these crops and such specialization has not increased risk on the farm too. A comprehensive study of area under Sorghum (Jowar) (Rao and Parveej, 2005) revealed that crops which are unable to compete in economics lose their area to the competing crops.

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Introduction:

It is well established that the relative importance of factors affecting cropping pattern may change over time. From a much generalized perspective, farmers are increasingly responsive to economic factors. This need not be surprising because irrigation expansion, increasing expenditure on paid out costs and decreasing size of holdings have contributed to minimizing the role of non-economic factors in crop choice of farmers. Moreover, globalization of agriculture after the World Trade Organization (WTO) agreements coming into force is strengthening the role of price related economic incentives in determining crop composition both at the micro and macro levels. In such a changing economic environment, government price and trade policies will become more powerful instruments for directing area allocation decisions of farmers, aligning thereby the crop pattern changes in line with globally changing demand-supply conditions. Almost all cultivable land has been brought under cultivation, hence, scope of area expansion is limited and further increases in agricultural production and farmers' income will depend upon changes in the cropping pattern through crop diversification taking into consideration of new high yielding varieties, technologies of cultivation, change in consumer taste and prices. Crop diversification is among the foremost strategies adopted by farmers for increasing their productivity per unit of area. On the eve of green revolution,

Kanwar (1972) estimated that the changing cropping pattern has made 8 percent contribution towards the increase in agricultural production in India. In seventies, the focus was on increasing

Review of Literature:

Aggarwal and Moudgil (2015) concluded that cropping intensity, irrigation intensity and crop yield and density of tractors had increased since green revolution but the contribution of agriculture to Haryana's GDP had declined over the years. Govt. should make efforts for agriculture development.

Singh (2015) found that highest cropping area was covered by wheat and rice respectively. In contrast, maize, jowar and barley covered lowest cropping area. Further the cropping intensity of Haryana had increased over the years. All districts had achieved above average cropping intensity except some few districts.

Hazare et al. (2014) revealed in their study that cropping intensity of Kohlapur district has increased through crop diversification. Authors concluded that cropping pattern had shifted to commercial crops. The shift in the pattern of cropping was influenced by improvement in irrigation and market facilities.

Kumar and Jain (2013) highlighted in their study the district wise disparity in agricultural productivity in India. Authors concluded that variations were due to differences in rainfall, resources for irrigation and use of modern agricultural

techniques. Raman and Kumari (2012) identified the region as well as district wise disparity in agricultural development of Uttar Pradesh. Authors found that central and western region were best performer while Budelkhand and Vindhyan zone lacked behind in the agricultural development. Singh (2012) revealed that the application of modern agricultural inputs had enhanced the cropping intensity. Further, agricultural productivity was increased due to use of improved fertilizers, seeds and modern equipments. Author indicated that environmental and physical factors were responsible for regional variations in agricultural development. Kalaiselvi and Sundar (2011) analyzed the variations in cropping intensity in India and concluded that highest cropping intensity was found in states of northern region while lower cropping intensity were observed in dry regions depending on rainfall. Authors found the cropping intensity was dependent on irrigation facilities.

Nag et al. (2009) found that Bikaner and Jaipur district had highest growth in cropping intensity while negative growth in cropping intensity was identified in Ajmer, Udipur and Bhilwara district. Authors further concluded that states with higher coefficient of variation (c. v.) experienced high fluctuation in rainfall and vice-versa.

Panigrahy et al. (2004) identified that the cropping pattern in Bhatinda district was shifted towards ricewheat and cotton-wheat rotation. Authors found that intensity of cropping had increased over time due to enlargement of area under rice cultivation. Karunakaran and Palanisami (1998) found that cropping intensity had significant relationship with irrigation intensity in Tamil Nadu. Irrigation through dug well and tube well were found to had more positive relation with cropping intensity. Authors concluded that state should make more investment on irrigation facilities.

Indian farmers grow a wide variety of crops in different seasons like summer (April-September), locally known as Kharif season, and winter (November-March) i.e. Rabi season and some crops which are grown in a hot and dry weather but within a shorter duration of April to July is locally known as Zaid season. The crops being produced in a region may depend upon its soil types (fertility, etc.), climate (temperature, rainfall, etc.) and moisture/irrigation level. For a single-cropped land there are a number of alternative crops from which the crop to be cultivated in a year may be chosen. Similarly, there are many different combinations of crops for double and triple-cropped lands. Different alternatives or combinations give different outputs (Sarker et al., 1997).

Multiple cropping reduces the risk of crop damages too. It is well recognized that suitable

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cropping pattern has considerable impact on the agricultural income of farmers (NABARD, 1997).

Crop combinations are important for increasing cropping Intensity. Over time, changing demands for food and related products and need to conserve the natural resources can also affect crop combinations in an area (Banik and Sharma, 2009).

Crop combination is a dynamic concept. Cropping patterns and crop associations change in space and time. Man, as a cultivator has been trying, right from the beginning of plants domestication to optimize his agricultural returns and to produce more for the growing pressure of population. For achieving this objective, he has been adopting new agricultural practices, such as crop rotations and crop combination throughout the agrarian history and is still persisting on new agricultural technologies and methods in search of ideal crop combination for each of the agro climate conditions. Now the farmers are growing a variety of crops with the intention to increase their agricultural incomes and to dispose of the produce in markets to earn more profit (Jana, 2017).

Although factors that influence the area allocation decision of farmers are all important but each one may differ in terms of the relative importance both across farm groups and resource regions (Sangwan, 1985).

Agriculture holds the key to prosperity. Despite decline in the share of agriculture to about one-fourth of Gross State Domestic Product, nearly two third of our population still depends on this sector for their livelihood. In terms of area, agriculture has already reached at a saturation level and almost all the available cultivable land in the state is under plough. Thus, there is hardly any scope to bring more area under cultivation. The agriculture production can only be increased through enhanced cropping intensity, change in cropping pattern, improvement in seeds of high yielding varieties, better cultivation practices and post-harvest technology etc., State Govt. is trying to re-orient agriculture in this direction through various policy measures for increasing the production. Even the risk due to price and yield has emerged significant in crops like gram and mustard (ibid). With increasing road net-work, penetration of rural markets, development and spread of short duration and drought resistant crop technologies (Bhalla & Gurmail, 1997), role of economic factors has increased. Of late, high value crops such as fruits and vegetables have attracted the farmers and acreage under these crops is increasing continuously

An empirical study has examined relationship between crop diversification and risk on the basis of all India data (Mukherjee, 2010) from 1995-96 to 2006-07 in 14 major states of India. It has computed yield risk and price risk of each state using the

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Markowitz's Meanvariance theory and mapped it with the crop diversification for the corresponding states. Its result shows that the diversifications in Indian states have not been able to reduce yield risk and hence cannot be termed efficient in nature, though it has positive impact on income risk. A study across states (Kalaiselvi, 2012) finds a mixed picture regarding the pattern of diversification across the states. Some states exhibit more diversification but no direct link between the number of crops and spread in the cropping pattern. In terms of relationship, there was inverse and positive relationship of increasing spread of the cropping pattern with income risk. But the macro area studies may iron out impact of changes in cropping pattern.

Basantaraya and G. Nancharaihb (2017) have studied the extent and pattern of crop diversification and its impact on farm income across all the districts of Odisha. Using the NSSO data of 70th round, the study has found three highly diversified districts have significantly higher average farm income than the moderately and least diversified districts. The medium farmers are the most diversified category of farmers in two out of the three highly diversified districts. The marginal farmers are the most diversified category of farmers in one highly diversified district. On the basis of regression analysis, the study has found that Scheduled Caste households in Odisha are less diversified in comparison to other households with higher the extent of irrigated land.

A study by Ghosh (2011) examines cropping pattern changes in Indian agriculture during the period 1970-71 to 2006-07 in terms of Herfindahl Index (HI) and substitution and expansion effects. The concentration reveals that the cropping pattern in India in terms of allocation of acreage is skewed towards cereal especially wheat and rice. However, a few non-food cash crops such as cotton, sugarcane, oilseeds, and vegetables have also emerged favorable among the farmers in recent years. Within the agriculture sector, diversification is a shift from the traditional cropping pattern of less remunerative crops to high value added diversified agriculture. In other words (IFPRI, 2007) diversification involves the changes in the production portfolio from the low-value to high value commodities like vegetables, milk, meat, eggs and fish based on the market demand that creates the new horizon for the rural income source. Sharma and Singh.

Prem kumar et. al. (2015) stated in their paper that there are different crop combination used in Palakkad district of Kerala. The study reveals that the crops are mostly adjusted to the irrigation facilities and soils of the district. Crop combination regions are identified and represented with suitable cartographic technique. In the study, Weaver's (1954) minimum

deviation method and Raffullah's (1965) maximum positive deviation method have been used to delineate the possible crop combinations during 2001 and 2011 in Palakkad district.

Tiwari and Sharma (2013) describe about different crop combination in Eastern Uttar Pradesh. A very simple technique of crop combination has been applied in this study to compute and analyze crop combination regions at district level. Six crop combinations out of eleven crops have been identified in this study. The main objective of the study is to delineate and analyze crop combination regions in eastern Uttar Pradesh. The authors also discussed the idea that the physical factors determine the shape of the area of crops, while the socioeconomic factors determine the extent. They further explain that government policies may often directly or indirectly influences decision to select the crops to grow.

Andrabi (2019) discussed about the major crop combination in Kashmir Valley. He studied the crop combination, cropping pattern and crop diversification in particular Region. The crop combination of various districts of valley is closely influenced by the terrain, soil and extreme climatic conditions. It has been calculated according to Weaver's, method that about 96 percent of the total cultivated land under food grain crops is dominated by rice and maize.

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