

*Full Length Research Paper*

## Impact of agricultural modernization on sustainable livelihood among the tribal and non-tribal farmers

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The sustainable livelihood links with security to basic human needs, food security, sustainable agricultural practices and poverty has an integrating concept. A large number of tribal communities are bereft of stable livelihood and thus they fall in the category of the vulnerable section of Indian society. Considering this fact, the study was conducted in Sabarkantha district of North Gujarat region of Gujarat state, as the economy of the district is basically dependent on agriculture. The farmers of Sabarkantha district are also innovative as well as enthusiastic in modern agriculture. Secondly, the districts rank first with respect to the tribal population. Looking to the common situation of the inhabited villages for the tribal and non-tribal farmer, 11 villages of Bhiloda and Meghraj talukas, having scheduled tribal population of 41 to 50 range of percentage were selected purposively. Total 220 farmers were selected from these villages (20 farmers in each village). For measuring the agricultural modernization and sustainable livelihood of the tribal and non tribal farmer's teacher made tests were developed. The thirteen major criteria of agricultural modernization and twelve sub indicators of sustainable livelihood were determined and total 200 score of agricultural modernization and total 300 score of sustainable livelihood was determined by conference method. The results showed that in case of tribal group, there was positively and significant association between the sustainable livelihood and seven criteria for agricultural modernization viz., extent of use of organic fertilizers, farming pattern, seed selection, available modern sources of energy equipments, extent of use of chemical fertilizers, use of plant protection measures and extent of use of improved dairy practices. While in case of non tribal group, all the 13 criteria of agricultural modernization studied were possessed positive and significant association with sustainable livelihood. It indicated the impact of the agricultural modernization on the extent of sustainable livelihood among the non tribal respondents, while it was very low in tribal farmers.

**Key words:** Bereft, modernization, sustainable livelihood, transition.

### INTRODUCTION

Agricultural modernization means from traditional agriculture to modern agriculture transformation process and means. In this process, the agriculture with modern industry, increasing in modern science and technology

and modern economy management method, make up the agricultural productivity by backward traditional agriculture increasingly contemporary world advanced level of agriculture. Agricultural modernization is a

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psychological state of farmer's mind. Indian society has been undergoing far reaching changes over the last two hundred years and some of all these changes can be subsumed under modernization. India provides a vast and fascinating laboratory for research into modernization. The main factor in the modernization process is represented by the levels of functional achievement attainable as a result of rapid and continuing growth of knowledge and technology in particular. There has been a transition from traditional farming to modern commercial agriculture, due to availability and growth of infrastructural facilities like improved seeds, varieties, fertilizers, pesticides, supplies and services, market facilities, literacy, mass media, research, teaching and extension. In India, agriculture and agro-based industries play an important role in the improvement of the rural economy. At present, about 70% of Indians depend on agriculture for their livelihoods. It is a major constituent of the Indian economy that accounts for not only the main source of income to the rural population, but also has a decisive say in all economic policies of India. Small and marginal farmers constitute a major portion of the rural agriculture sector. The Indian industry is also largely reliant on agriculture for both inputs and end-user applications. However, the limited availability of land, the limited cash returns, and agriculture being confined to one or two seasons in the year, have made the villagers look for other livelihood support systems for their sustenance. A large number of tribal communities are bereft of stable livelihoods and thus they fall in the category of the vulnerable section of Indian society. Therefore, It is essential to provide the latest information regarding the agricultural modernization to sharpen their knowledge in terms of assets and activities required for a means of living, not only living but have been lead to formalization of the sustainable livelihood approach. Considering this fact, the study was carried out with the objective to evaluate the impact of agricultural modernization on sustainable livelihood of tribal and non-tribal farmers.

## METHODOLOGY

The present study was conducted in Sabarkantha district of North Gujarat region of Gujarat state. The economy of the district is basically dependent on agriculture, as 62.8% workers are engaged in primary sector and the farmers of Sabarkantha district are innovative as well as enthusiastic in modern agriculture. Sabarkantha ranked first with respect to the tribal population in the state. Considering the highest tribal population, multistage random sampling technique was used to select the respondents. According to the Census - 2001 (Anonymous, 2001), proportion of scheduled tribes population to total population in villages are categorized in 9 different percentage ranges at district level, that is, zero percentage range of scheduled tribes population to 76 and above percentage range. It is seen that only 14 villages out of 1,372 were having percentage range of scheduled tribes population of 41 to 50; covered in Khedbrahma, Vijaynagar, Bhiloda, and Meghraj talukas of the district. Among these four talukas, considering the numbers

of villages, Meghraj and Bhiloda talukas were selected purposively. Looking to the common situation of the inhabited villages for the tribal and non-tribal farmers, 11 villages of Bhiloda and Meghrajtalukas, having scheduled tribes population of 41 to 50 range of percentage were selected purposively. Total of 220 farmers were selected from these villages (20 farmers in each village). For measuring the agricultural modernization and sustainable livelihood, teacher made test were developed. The test of agricultural modernization was consisted of the major thirteen criteria. The criteria discussed with the experts and total 200 score of agricultural modernization was determined by conference method. For standardizing the score, the Agricultural Modernization index (AMI) was calculated, for each individual respondent and grouped into three categories viz., low, medium and high AMI. The test of sustainable livelihood was also developed with the help of three main indicators and 12 sub indicators were included after discussion with experts and total 300 score of sustainable livelihood was determined. For standardizing the score, the Sustainable Livelihood Index (SLI) was calculated for each individual respondent.

## RESULTS AND DISCUSSION

In the era of globalization the question of sustainable livelihood has captured all the points of discussion. Various people have defined livelihood differently. Chambers and Conway (1992) define livelihoods as: "A livelihood comprises the abilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities to the next generation; and contribute net benefits to other livelihoods at the local and global levels in the long and in the short term." The concept of sustainable development has acquired the central theme of any tribal development. The concept of sustainable development emerged in the 1980s. It propelled a paradigm shift in development thinking, and continues to dominate the development-discourse at various levels, from the local to global. The best explanation to sustainable development was given by the World Commission for Environment and Development (WCED, 1987), "Our common future", as, "the ability to meet the needs of the present without compromising the ability of the future generation to meet their own needs". The concept of livelihood is rapidly gaining acceptance as a valuable means of understanding the factors that influence people's lives and well-being. "It is comprised of capacities, assets, and activities required for means of living. A livelihood will be sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capacities and assets, both now and in the future, while not undermining the natural resource base" (Carney, 1998). Sustainable livelihood is a way of thinking about the objectives, scope and priorities for development, in order to enhance progress in poverty elimination. Sustainable livelihood aims to help poor people achieve lasting improvements against the indicators of poverty that they

**Table 1.** Correlation coefficient of criteria of agricultural modernization with sustainable livelihood of tribal and non-tribal respondents (n = 220)

S/No.	Name of criteria for agricultural modernization	Correlation coefficient "r" value	
		Tribal farmers	Non-tribal farmers
1	Farming pattern (X1)	0.1892*	0.3045**
2	Seed selection (X2)	0.1907*	0.3660**
3	Use of irrigation system (X3)	0.1795 NS	0.2024*
4	Use of underground pipeline for irrigation (X4)	0.1670 NS	0.2130*
5	Use of transportation facility for marketing of agricultural production (X5)	0.1589 NS	0.5779**
6	Available modern machinery and implements (X6)	0.1633 NS	0.2385*
7	Available modern sources energy equipments (X7)	0.1924*	0.2289*
8	Extent of use of chemical fertilizers (X8)	0.2012*	0.3263**
9	Extent of use of organic fertilizers (X9)	0.2823**	0.2095*
10	Extent of use of storage facility (X10)	0.1562 NS	0.2125*
11	Use of Plant protection measures (X11)	0.2023*	0.4657**
12	Extent of use of harvesting structures (X12)	0.1724 NS	0.2384*
13	Extent of use of Improved dairy practices (X13)	0.2182*	0.3230**

\*,\*\* significant at 5 and 1% levels of significance. NS = Non-significant.

define. In spite of all these development initiatives the tribal in our country are still threatened by severe poverty (Mishra, 2007).

#### **Relationship between selected criteria for agricultural modernization index and the sustainable livelihood of tribal and non-tribal respondents**

On the basis of the operational measures developed for the variables, null hypotheses were stated for testing the relationship and their significance on zero order correlations. The zero order correlations were presented in Table 1. It is clear from the results (Table 1) that out of 13 criteria of the AMI among the tribal respondents, the correlation coefficient of one criteria *viz.*, "extent of use of organic fertilizers" (0.2823) was statistically found to be positively and significantly correlated with sustainable livelihood index at 0.01 level of significance, whereas 6 criteria *viz.*, farming pattern (0.1892), seed selection (0.1907), available modern sources of energy equipments (0.1924), extent of use of chemical fertilizers (0.2012), use of plant protection measures (0.2023) and extent of use of improved dairy practices (0.2812) were statistically found to be positively and significantly correlated with sustainable livelihood index of tribal respondents at 0.05 level of significance. As far as the criteria, *viz.*, use of irrigation system, use of underground pipeline for irrigation, use of transportation facility for marketing agricultural production, available modern machinery and implements, extent of use of storage facility and extent of use of harvesting structures concerned, the computed correlation coefficient were found to be positive but non-significant. The above

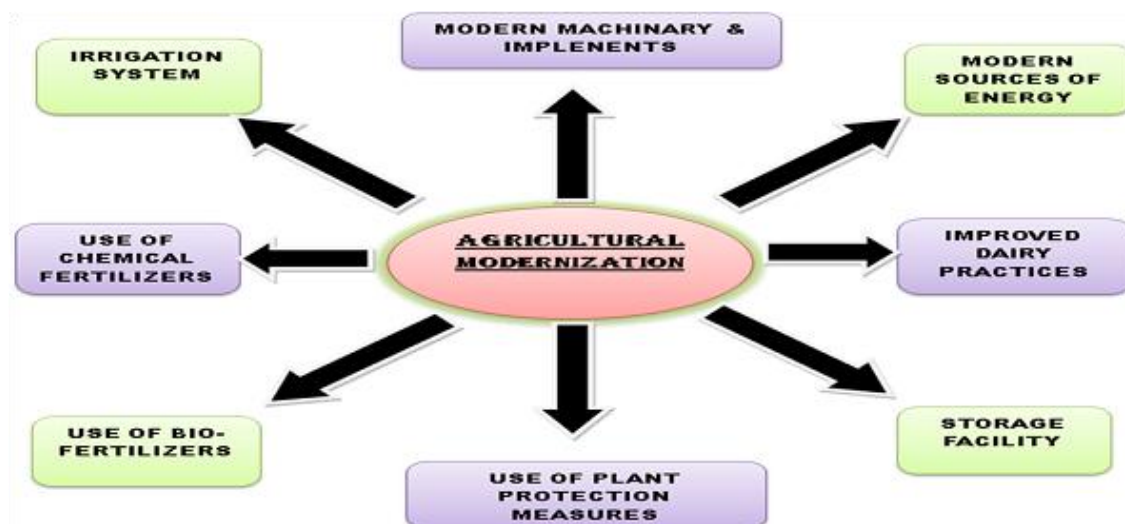
discussion leads to be concluded that criteria of agricultural modernization (Figure 1) *viz.*, extent of use of organic fertilizers, farming pattern, seed selection, available modern sources energy equipments, extent of use of chemical fertilizers, use of plant protection measures, extent of use of improved dairy practices affected significantly and positively the sustainable livelihood of tribal farmers. The probable reason might be that the tribal farmers have somewhat changed their traditional farming to scientific farming and more attention towards the dairy practices and obtain the advantage of communication system as well as marketing and input supply and, services and facilities. The animals are the source of organic manure and also subsidiary income might gave courage to take risk to adopt such a new concept of organic farming, which was directly or indirectly influenced and extent of sustainable livelihood.

While in case of non-tribal respondents, out of 13 criteria of the AMI, the correlation coefficient of six criteria *viz.*, farming pattern (0.3045), seed selection (0.3660), use of transportation facility for marketing agricultural production (0.5779), extent of use of chemical fertilizers (0.3263), use of plant protection measures (0.4657) and extent of use of improved dairy practices were statistically found to be positively and significantly correlated with sustainable livelihood at 0.01 level of significance, while remaining seven criteria *viz.*, use of irrigation system (0.2024), use of underground pipeline for irrigation (0.2130), available modern machinery and implements (0.2385), available modern sources of energy equipments (0.2289), extent of use of organic fertilizers (0.2095), extent of use of storage facility (0.2125) and extent of use of harvesting structures (0.2384) were statistically found to be positively and significantly

**Table 2.** Association between the agricultural modernization of the tribal and non-tribal respondents and their sustainable livelihood.

Consequent variable	Correlation coefficient „r“ value	
	Tribal farmers	Non-tribal farmers
Agricultural modernization	0.1527NS	0.3613**

\*\* Significant at 1% levels of significance. NS= Non-significant.



**Figure 1.** Agricultural Modernization index (AMI).

correlated with sustainable livelihood at 0.05 level of significance (Table 1). The above discussion leads to be concluded that all selected criteria for agricultural modernization were significantly and positively correlated with sustainable livelihood of non-tribal respondents. It is interesting that all criteria for agricultural modernization were applied by the non-tribal respondents and changed their traditional ways of livelihood. It was indicated that, the impact of the agricultural modernization on the extent of sustainable livelihood among the non-tribal respondents. The probable reasons might be that the non-tribal respondents have changed their ways of living owing to distinguishes changes of assets *viz.*, natural, social, human, physical and financial.

#### Evaluate the impact of agricultural modernization on sustainable livelihood

It is clear from Table 2 that the agricultural modernization (0.1527) was positively but non-significantly correlated with sustainable livelihood of tribal respondents, while the agricultural modernization (0.3613) was positively and significantly correlated with sustainable livelihood of non-tribal respondents at 0.01 level of significance. Therefore, it can be concluded that the agricultural modernization

was more affected for the sustainable livelihood of non-tribal respondents in comparison of tribal respondents. The probable reason might be that sustainable livelihood index is the function of many indicators. All the identified indicators of sustainable livelihood have adopted the agricultural modernization. However, it was observed very low in tribal respondent. Siva and Eswarappa (2005) also reported that during the last 50 years the planning process in India has failed to reduce the disparity between the tribal and non tribal populations. Today, the first and foremost problem before tribal communities in India is how to earn and sustain livelihoods. There are varieties of livelihoods practices by the tribal communities in different part of India and elsewhere, such as by the hunter-gatherers, pastoralist, shifting cultivators, who live in different environments. A number of changes have been taking place with regard to the land use, access, control and utilization of their resource and these changes in term have largely affected the sustainable livelihoods of the people without any sustainable replacement.

#### Conclusion

It can be concluded that the impact of agriculture

modernization was more affected for the sustainable livelihood of non-tribal respondents in comparison to tribal respondents. It indicated that the non-tribal respondents have changed their ways of living owing to distinguishes changes of assets viz., natural, social, human, physical and financial. However it was observed very low in tribal respondents.

### **Conflict of Interests**

The author(s) have not declared any conflict of interests.

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