

SUSTAINABILITY, LIVELIHOOD AND RURAL ECONOMY: A STUDY ON AGRICULTURAL OPPORTUNITIES AND CHALLENGES IN THE DISTRICT OF NALBARI, ASSAM

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ABSTRACT:

Agriculture is the backbone of Indian economy. It is the largest source of income, employment and basis for other sectors which provide employment to millions of workers directly or indirectly. As the main source of income, more than fifty percent of the population are involved with agriculture and have been practicing various methods of agriculture from time to time to produce more crops in their land. But in spite of agro-based economy of the entire country, the economic condition of the individuals involved in this sector is deplorable. They are struggling with their livelihood. In our country, various attempts and experiments have been made for the development of agricultural sector including green revolution. But, no one has been sustainable in the long run. Therefore, sustainable agriculture along with agricultural diversification may be a viable option in this regard. Keeping in view the above mentioned context, the present study, using qualitative methodology, attempts to examine the role of sustainable agriculture in livelihood and rural economy. It is an attempt to assess the opportunities and challenges of sustainable agriculture in Nalbari district of Assam. This paper contributes to the literature on sustainable agriculture and livelihood.

KEY WORDS: Agricultural Diversification, Sustainable Agriculture, Livelihood, Rural Economy.

INTRODUCTION:

India lives in the villages where agriculture is the main source of livelihood. Agriculture is the backbone of Indian economy. It is the largest source of income, employment and basis for other sectors. It is also an age-old tradition of our society which provides employment to millions of workers directly or indirectly. According to agricultural census of India, 2011, an estimated 61.5% of the 1300 million Indian populations live in rural areas and are dependent on agriculture. Like India, agriculture plays a prime role of revenue earning in the economy of Assam. More than fifty percent of the total population i.e. 312.05 lakhs (Census, 2011) of the state involve in agricultural activities. According to the Statistical Handbook of Assam, 2018, 86% population of Assam lives in the rural areas. As the main source of income, the rural farmers have been practicing various methods of agriculture from time to time to produce more crops in their land. For this purpose, they have been using more and more modern seeds of high yielding varieties, pesticides, fertilizers and chemicals which have degraded fertility of land as well as quality production. In this regard, we may refer to the famous green revolution of our country which was started in a revolutionized way for the development of agriculture, the impact of which is not beyond question.

Does Green Revolution lead to sustainable agriculture?

In the late 1960s, the concept of green revolution was introduced in India especially in Punjab, Haryana and Uttar Pradesh. The farmers of these states used high yielding varieties (HYVs) of seeds which were supposed to produce more crops in comparison to the traditional ones. They also used chemical fertilizers and pesticides along with plenty of water which were essential for HYV seeds. After having all these, the farmers could attain more profit by producing more in their limited land. However, this scenery of increased production was not enduring in due course of time. Due to the excessive use of chemicals and fertilizers, the soil of these areas had lost its fertility. Even, the level of ground water had also depleted to a great extent due to excessive use of it for tube-well irrigation. Here again comes the question of sustainability of land.

Will Land sustain?

Land is the base of natural resources which we should use very carefully. Due to excessive application of modern methods of farming, the natural resource storage capacity of land has been degrading day by day. Besides these, industrialization and urbanization have badly affected the prospects of agricultural land. There is also a hidden pressure from the legislature over the agricultural land in the name of industrialization and development which is evident from the recent ordinance of the Assam Government. In spite of the opposition from various corners of the state, the Government of Assam on 29th of June, 2020 had passed an ordinance for the establishment and development of industries which allowed the micro, small, and medium enterprises (MSMEs) to start their industries without taking permission, clearance or even licence for three years. They can start it only by submitting a simple self-declaration letter. Now, if it becomes an Act, then anyone will be able to set up their industry in Assam by converting the agricultural land into land for industrial purposes. “Allowing industries to set up without any clearance from the revenue department solely on the basis of a self-declaration form will hit the land rights of Assamese people and make the state a playground for industrialists from outside. We want this ordinance revoked at the earliest”, said Lurinjyoti, Gogoi, general secretary, AASU (hindustantimes, dated 1st July, 2020). Therefore, the question of sustainability of agricultural land has become the worth question of the contemporary age.

What is next?

As mentioned above, agriculture is the main source of livelihood in the rural economy. Therefore, it must be sustainable so that the people engaging in this sector may fulfill their fundamental needs. It will also encourage others to be involved in it which will again minimize the burning problem of unemployment in our country. In our country, various attempts and experiments have been made for the development of agricultural sector including green revolution. But, no one has been sustainable in the long run. Therefore, sustainable agriculture may be a viable option in this regard. Sustainable agriculture may be helpful in reducing agricultural pollution which emphasizes on the use of traditional seeds. It also encourages the use of green manure and bio-control measures instead of genetically engineered seeds, fertilizers and pesticides to reduce agricultural pollution. In other words, adoption of organic agriculture can reduce negative environmental and social effects (Parrot and Marsden, 2002).

Keeping in view of the above, the present study attempts to examine the role of sustainable agriculture in livelihood and rural economy and to assess the opportunities and challenges of sustainable agriculture in Nalbari district of Assam. The present study, preceded by an introduction is organized into the following divisions. The existing relevant literature on agriculture, livelihood and rural economy is discussed in the section II. The methodology of the study is highlighted in the section III. Section IV explains the context of the study. Section V presents the findings and analysis of the study followed by recommendations. Section VI comes up with the conclusion of the study.

LITERATURE REVIEW:

In this section, we have reviewed the related literature regarding agriculture and its allied sectors. Before going into detail explanation, the present study first attempts to clarify the term sustainable agriculture. Here, sustainable agriculture refers to that system of agriculture, where society's present requirements of food and textile are met without compromising agricultural capacity and land quality for future generation.

Agriculture is one of the largest sectors of Indian economy providing economic incentives as well as employment. It is also the main source of livelihood especially in the rural areas. Many important changes have been made in the way of practicing agriculture with the development of modern technology and innovation.

“The story of the development of agricultural mechanization in India is both fascinating and in many ways, quite remarkable. The country has moved forward over the past six decades from one in which it then faced severe food shortages to where today it has become an exporter of many food commodities and a major exporter of other industrial products, including agricultural tractors. This has been achieved despite a more than three-fold increase in its population and insignificant increase to the arable land area” (Singh, 2015: 64).

Explaining the growing demand for food to feed the people Singh (2015) observes, “The total land area of the country is 297 million hectares of which 142 million ha is classed as agricultural land. Whilst it has basically an agrarian economy the share of agriculture has now declined to 14 per cent from a level of 56 per cent in 1950. The manufacturing and service sectors presently constitute 27 per cent and 59 per cent of the economy, respectively. The biggest challenge which the agricultural sector is facing is to meet the growing demand for food to feed the ever growing population of the country” (Singh, 2015: 64).

Various risk factors are associated with the agricultural sector which may vary place to place. In this regard scholars like Hazell (1992) opined, “Agricultural production is inherently a risky business, and farmers face a variety of weather, pest, disease, input supply and market-related risks. Given an uncertain income each year, farmers must worry about their ability to repay debt, to meet overhead costs (e.g. land rents and taxes) and, in many cases, their ability to meet essential living costs for their families. These same risks are also of concern to agricultural credit institutions. Confronted with risky borrowers, lenders must seek to reduce the possibility of poor loan recovery rates in unfavorable years, even if this means only modest levels of lending to agriculture” (Hazell, 1992: 567).

On the basis of the risks, Hazell again remarked, “The major risks confronting farmers can be grouped as follows: *market risks*, such as the prices of outputs and inputs, and interest rates; *resource risks*, such as uncertain supplies of labour, credit and irrigation water, or the timeliness of supply of seeds and fertilizers; *production risks*, which cover a whole gamut of pest, disease and weather-related risks; *health risks* (sickness, death and accident) of the farmer and his/her dependents; *asset risks*, such as theft or fire damage to buildings, machinery and livestock; and *other risks*, such as confiscation of land, war damage, and other ‘acts of god’” (Hazell, 1992: 568).

A set of existing literature argues that high indebtedness, dependence on natural assets, land fragmentation and high input cost threaten livelihood of many families doing agricultural farming (Ninan and Chandrashekar, 1993).

Another set of literature argues that credit is important for development of the agricultural sector. However, Small and marginalized farmers face difficulties to access into formal credit; usually they do not get benefits of formal credit provided by public sector banks (Rao and Suri, 2006; Ramachandran and Swaminathan, 2002; Reddy, 2010).

Proper distribution and ownership of land is one of the basic conditions for the development of agriculture and the peasants involved with it. But, there are some gaps in this regard in our country. Therefore, scholars like Griffin and Khan observed, “Given the structure of the economy ... and the resulting nature of the processes of capital formation and innovation, the faster is the pace of expansion of the population and labour force, the stronger will be the tendency for the standard of living of some groups or classes to fall It is important to underline, however, that the cause of increasing poverty in Asia is not an alleged population explosion. Rapid

population growth is merely a contributing factor. The basic causes are the unequal ownership of land and other productive assets, allocative mechanisms which discriminate in favour of the owners of wealth, and a pattern of capital accumulation and technical innovation which is biased against labour” (Griffin and Khan, 1978: 301).

Highlighting the increasing unequal balance between population and resources, Stavenhagen argues, “It is ... a mistake to attribute the depletion and misuse of local resources, as some authors do, exclusively to the demographic pressure on the land. While population growth has played a role in this process, the development of market relationships is surely the main cause of the increasing disequilibrium between population and resources at the local level” (Stavenhagen, 1977: 45).

Poverty and illiteracy lead to isolation which ultimately deprives the peasants from getting their desired benefits. As a result of these they become more vulnerable and keep themselves aloof from the competent authority from whom they would have been benefited. Thus, “*Isolation* (lack of education, remoteness, being out of contact) sustains poverty: services do not reach those who are remote; illiterates cannot read information of economic value, and find it difficult to obtain loans. Isolation goes with physical weakness: remote households may have a high level of migration of the able-bodied to towns or to other rural areas. Isolation also accentuates vulnerability - remote marginal areas are more liable to crop failures, and are less well provided with services to handle contingencies like famine or sickness; illiterates also find it harder to register or acquire land and are more easily cheated of it. And isolation means lack of contact with political leaders or with legal advice, and not knowing what the powerful are doing” (Chambers, 2013: 113).

Reddy and Ankaiah argue, “The majority of the farming community is not getting upper bound yield, despite successful research on new agricultural practices, crop cultivars, crop cultivation and pest control techniques ... The term upper bound yield refers to the yield that could be obtained using proper cultivation methods subject to advances in agricultural technology at that time. The upper bound yield may change with progress in agricultural research. One of the reasons is that the appropriate and timely scientific advice about farming is not reaching the farmers” (Reddy and Ankaiah 2005: 1909).

Role of Information and Communication Technologies (ICTs) is also essential the development of agriculture. Use of ICT improves Indian agricultural economy by a contribution of 3% economic growth (Adhau, 2010). According to some scholars, information communication technology refers to a set of tools and techniques – hardware and software connected through internet – that can be used to gather, disseminate, store and use information for decision making (Pretty, Ball, Xiaoyun, and Ravindranath, 2002; Dewan and Kraemer, 2000).

Some scholars argue that using ICT, latest expert-developed information can be provided to the farmers in a regular and timely manner, leading to higher agricultural production and market reach for the farmers (Inkkaar, O’Mahony, and Timmer, 2005). However, lack of sufficient information does not allow the farmers to sell their products at market price. This issue can be addressed by the use of information and communication technologies, leading to sustainable agriculture. However, use of ICT is limited to marginalized farmers in countries like Kenya (Epstein, 2008).

Weather is an important component of agriculture. Some scholars argue that extreme weather reinforces poverty as poor households opt for low-risk strategies, reducing income and putting the households into more pauperization (Carter and Barrett, 2006; Rosenzweig and Binswanger, 1993).

Proper electricity is necessary for the development of agriculture and its allied activities. Another set of scholars argues that supply of electricity is essential for agricultural development, especially to eradicate poverty (Besant-Jones 2006; Sachs, 2005).

Agricultural knowledge and information systems (AKIS), developed in 1980s, is defined as ‘a set of agricultural organizations and/or persons, and the links and interactions between them, engaged in such processes as the generation, transformation, transmission, storage, retrieval, integration, diffusion and utilization of knowledge and information, with the purpose of working synergetically to support decision-making, problem solving and innovation in a given country’s agriculture or domain thereof’ (Roling 1990: 1). Many developing

countries developed this system (AKIS) to help out the farmers. However, agricultural research outputs do not reach the poor farmers (Anderson, Pardey, and Roseboom, 1994; Huffman and Evenson, 1993; Alston, Norton, and Pardey, 1998).

Adoption of organic agriculture can reduce negative environmental and social effects and enhance income of the farmers who could sell such produce (Parrot and Marsden, 2002). Another set of literature argues that 'diversification of agriculture may be a viable path to make the agricultural sector more efficient through which the individual farmer can enjoy high profit' and it 'will ensure more income to the farmers, more employment opportunities, development of agro- based industries in the state and more investment in the farm sector leading to economic prosperity' (Goswami, 2020:165-66).

Highlighting the above sets of existing literature, the present study assumes that sustainable agriculture may be a viable option for the livelihood of the rural farmers providing employment as well as to boost up the economy of our state.

OBJECTIVES:

The basic objectives of the present study include:

- a) To examine the role of sustainable agriculture in livelihood and rural economy;
- b) To assess the opportunities and challenges of sustainable agriculture in Nalbari district of Assam.

MATERIALS AND METHODS:

The study used in-depth interview method for the purpose of data collection in the district of Nalbari, Assam (Denzin and Lincoln, 1994). Interviews were transcribed and analyzed using content analysis. 50 respondents were interviewed. They were stratified by sex, caste and religion. The study used census report and electoral rolls of the selected villages under the 61 No. Ghoga Gaon Panchayat, Nalbari district to make the stratification. It is located in 60 No. Barkhetri Legislative Assembly Constituency of Assam surrounded by the village of Dagapara in the North, Kurihamari Panchayat in the South, Loharkatha in the East and Kandhbari Panchayat in the West.

According to the census of 2011, the Ghoga Gaon Panchayat consists of 20489 total population, out of which 10317 and 10172 are males and females respectively (Census, 2011). Nalbari district, which has 1052 sq.km area, is situated in the lower Brahmaputra Valley, Assam. As per census report 2011, Assam covers an area of 78438 square km having total population of 3, 12, 05,576 with a literacy rate of 72.19. The density of population is 398.

CONTEXT OF THE STUDY:

Agriculture is the most labour absorbing sector of the Indian economy. Among the three main sectors of activities i.e. primary, secondary and tertiary, agriculture is included in the primary sector. More than fifty percent of the population is involved with agriculture but in spite of agro-based economy, the economic condition of the people involved in this sector is deplorable. They are struggling for their livelihood which is an alarming signal for all of us. Therefore, it needs attention from the government with adequate reforms for its development. Agriculture is also essential for providing food to the people living in the urban areas especially in the industrial hub of our country. Although, various studies have been made towards the development of agricultural sector, yet adequate in-depth study in the remote rural areas are not done exploring the factors that influence in the development of the sustainable agriculture. Therefore, the humble attempt of this study is to examine the role of sustainable agriculture in livelihood and rural economy and to assess the opportunities and challenges of sustainable

agriculture in Nalbari district of Assam. This study contributes to the literature on sustainable agriculture and livelihood.

FINDINGS AND ANALYSIS:

In this section, we have presented the findings of the present study. It is explained with the help of some sub points given below:

- **Agriculture, livelihood and food security**

As mentioned earlier, agriculture is the main source of income and livelihood in rural Assam. It is also helpful for the unemployed youths to earn their livelihood. Today we are talking about self-determination and food security in India. But, to attain these, we must have sustainability in agriculture which will provide us sufficient food, employment opportunity, income and finally economic empowerment. It will also absorb the huge labours that have returned from other states of our country due to the world pandemic, Covid 19. However, to get sustainable agriculture, we must be able to face the challenges and problems that come on the way of sustainable agriculture. Regarding this, the farmers should be provided with knowledge about the application of fertilizer, pesticides and other necessary information which will inspire them in their farming.

- **Agriculture and employment**

As discussed earlier, agriculture provides ample opportunities for employment. There is also high prospects of proliferation of income in this sector. However, due to lack of awareness and proper information about the prospects of employment opportunity, it has not been able to attract the unemployed youths of our society. Even, the farmers engaged with it are also not trained properly regarding various aspects of agricultural activities. Thus, proper and up to date timely meeting and training is necessary to boost up this sector.

- **Agriculture and seasonal unemployment**

Although agriculture provides ample employment opportunity, yet it is also seen that seasonal unemployment happens in this sector. It is found in the study that except the busy seasons like- sowing, harvesting, weeding and threshing, the farmers in other seasons do not have work relating to agriculture. Thus, they are 'seasonal unemployed' for some months of the year. In this case, diversification of agricultural may be a viable option for them to minimize the seasonal unemployment among the rural farmers.

- **Agriculture and natural calamities**

Another major challenge of sustaining agriculture is the natural calamity. Erosion of land, regular flood, draught etc. badly affect the production of agriculture. Regular flood swipes away the hopes and aspirations of the farmers. Besides, due to the erosion of land many of the farmers had already lost their cultivable lands. Even, the attacks of some seasonal insects also destroy the hard working-made crops of the farmers. All these natural calamities make obstacles for the farmers to be depressed and lead them to become poorer day by day. However, insurance of the crops may be an alternative solution in this regard.

- **Agriculture and lack of proper markets**

Market plays an important role in developing the agricultural sector. There is high commercial opportunity in this sector. But, lack of proper marketing facilities stands as restriction on the way of its development which discourages the farmers involved with it. They are not getting their due benefit which they deserve. It creates depression among the prospective farmers. This is revealed by them during field interview. One of the respondents said: "We are discouraged in agricultural activities as we have not got the real price of our hard working

production due to lack of proper marketing facilities. The middlemen are getting more benefit without working hard in comparison to us.” Thus, it can be said that lack of proper markets played a negative role in this regard.

- **Agriculture and inadequate infrastructural facilities**

It is found in the study that infrastructural facilities like cold storage, godowns etc. are not adequate in this sector. But, various agricultural products need these facilities as they are not durable without such infrastructures. As a result, the farmers have been facing extensive financial loss in their production. It is evident from the words of a farmer who said: “We are bound to sell our product daily. We do not have cold storage facilities. Our products are highly perishable. So, we do not have bargaining capacity. If we cannot sell in time, it will be a huge loss for us.” Thus, it is seen that infrastructural facilities like cold storage facility are not adequate in the study area.

- **Agriculture and problem of irrigation**

Proper irrigation is essential for agriculture. But, for the seeds of high yielding varieties and use of other chemicals and pesticides, plenty of water is needed. For this, deep tube well is necessary which again has become a serious threat for land and agriculture. Due to the overuse of ground water, its level is declining day by day in a rapid way. It will be another challenge for the development of sustainable agriculture in near future. So, the need of the hour is to encourage for diversification of agriculture through which we can produce comparatively high without using too much chemicals, fertilizers, pesticides including HYVs. It will sustain our agriculture.

- **Agriculture and research and development**

For any development, resources are very important. But, it is seen in the present study that in the name of high production, huge pressure has been put not only on land but also other natural resources. It will decrease the fertile quality of land in the long run. Therefore, we should utilize and consume it rationally so that socio-economic and environmental balance is maintained. Again, sustainable and organic agriculture may be helpful in this regard which needs proper research and development.

- **Agriculture and financial scarcity**

Financial hardship is one of the important problems for developing agricultural sector. It reveals in the study that no formal credit facilities are available for the rural farmers. But, credit is important which needs loans from the banks and other financial institutions. However, the credit must be used for income generation instead of using it for consumption. Besides, it is a matter of trust from both the banks as well as borrowers. Trust is very important for getting financial help which again related with the good repayment history. It is found in the field report that majority of the farmers did not pay their loans regularly which ultimately affects the other aspirants in this field.

- **Agriculture and government support**

Support of the government is very essential for the development of any sector including agriculture. It may be materialistic or non-materialistic. It is found in the present study that there are problems in the implementation part of the government-sponsored schemes. Here, we may refer to the benefit leakages of the scheme, namely the PM-KISAN where non-beneficiaries are included without the knowledge of the government. Therefore, the government should have proper monitoring system with some incentives for those farmers who are engaged with agriculture with full dedication.

• Agriculture and corruption

Corruption is another important finding which the present study reveals. Although the government has adopted various policies and programmes from time to time, yet the real or targeted beneficiaries are not getting the actual benefit. There is exclusion of beneficiaries. In other words, there is benefit leakage in this regard. Thus, in spite of the efforts of the government to develop the agricultural sector along with the farmers, it is evident that such policies are out of reach of the real beneficiaries. Transparency is important in this regard.

From the above analysis, it is evident that agricultural sector is running with enormous problems and challenges. However, if we can mitigate these problems, then definitely it will be able to contribute a lot towards the development of not only the farmers but also of the state as a whole. Ultimately, it will boost up the economy of our country.

RECOMMENDATIONS:

From the findings and analysis of the present study, the following recommendations may be forwarded:

- Government should encourage organic farming and provide necessary facilities and incentives for those who are engaged with it.
- There should be extensive awareness and training programme along with proper information centre for the farmers which will improve their capability and efficiency.
- In order to reform this sector, the government should come forward with adequate policies and programmes. In this regard, some specific rules must be prepared to control the money lenders and middlemen who try to exploit the hard working farmers.
- Financial institutions should come forward to encourage the unemployed persons by sanctioning loans and other financial helps. Of course, such institutions should also take strict actions against those who neglect to repay their previous loans (Das, 2020: 444).
- There should be proper marketing facilities along with godowns and cold storage facilities for the farmers.

CONCLUSIONS:

Sustainable agriculture with proper planning and training for the individuals involved in it is the call of the time. Joint ventures of public private partnership may be viable options for the development of the agricultural sector on the one hand and economic development of the state on the other hand which will be beneficial for all. Government should come forward in this regard. The people engaged with agriculture should also come forward and involve with it which will ultimately make our agricultural sector a sustainable one. We may also refer the famous argument of Mahatma Gandhi through which he wanted to replace the 'mass production' with 'production by the masses' i.e., "There is enough for everybody's need and not for anybody's greed." In conclusion, we may say that sustainable agriculture may be a viable way to provide us food, self-sufficiency and employment not only for the rural areas but also for the state as a whole. And, agricultural diversification may be an alternative solution in this regard (Goswami, 2020:165). Thus, the present study contributes to the literature on sustainable agriculture and livelihood.

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REFERENCES:

- i. Adhau, B. (2010). Contribution of E-Agriculture in the development of India: A generalized study. Takshashila.

- ii. Alston, J. M., G. W. Norton, and P. G. Pardey. 1998. *Science under Scarcity*. Ithaca, NY: Cornell University Press.
- iii. Anderson, J., P. Pardey, and J. Roseboom. 1994. "Sustaining Growth in Agriculture: A Quantitative Review of Agricultural Research Investments." *Agricultural Economics* 10(2): 107–123.
- iv. Bandyopadhyay, D., Yugandhar, B.N. and Mukherjee, A., 2002: Convergence programmes by empowering SHGs and PRIs. *Economic and Political Weekly* 37(26), 2556–2561.
- v. Besant-Jones, John. 2006. "Reforming Power Markets in Developing Countries: What Have We Learned?" Energy and Mining Sector Board Discussion Paper No. 19. Washington, DC: World Bank.
- vi. Carter, M.R., and C.B. Barrett. 2006. "The Economics of Poverty Traps and Persistent Poverty: An Asset Based Approach." *Journal of Development Studies* 42:178–99.
- vii. Carter, M.R., and C.B. Barrett. 2006. "The Economics of Poverty Traps and Persistent Poverty: An Asset Based Approach." *Journal of Development Studies* 42:178–99.
- viii. Chambers, Robert (2013). *Rural Development: Putting the last first*. Routledge, New York.
- ix. Das, B., "Adoption of Commercial Weaving as an Income Generating Tool in Rural Economy: Lessons on Opportunities and Challenges in the District of Nalbari, Assam." *Adalya Journal*, 9(5):444, 2020.
- x. Dewan, S., and Kraemer, K. L. (2000). Information Technology and Productivity: Evidence from Country-Level Data. *Management Science*, 46(4), 548–562.
- xi. Epstein, E. (2008). *Agriculture, Research, and Shortages of Funds and Food*. Science, New Series, 181(4104), 997.
- xii. Gajendra Singh, Agricultural Mechanisation Development in India, *Indian Journal of Agricultural Economy*. Vol.70, No.1, Jan.-March 2015, pp. 64-82.
- xiii. Goswami, D. (2020). Development of Allied Activities in Agriculture: The Diversification Strategy in Assam Agriculture. *Journal of Xidian University*, Vol. 14, Issue 6, pp. 165-166
- xiv. Griffin, Keith and Khan, Azizur Rahman, 1978, 'Poverty in the Third World: Ugly Facts and Fancy Models', *World Development*, 6, 3, pp. 295-304.
- xv. Huffman, W. E., and R. E. Evenson. 1993. *Science for Agriculture: A Long-term Perspective*. Ames, IA: Iowa State University Press.
- xvi. Inklaar, R., O'Mahony, M., & Timmer, M. (2005). ICT and Europe's Productivity Performance: Industry-Level Growth Account Comparisons With the United States. *Review of Income and Wealth*, 51(4), 505–536.
- xvii. Ninan, K.N. and Chandrashekar, H. (1993): Green Revolution, dry-land agriculture and sustainability. Insights from India. In: *Economic and Political Weekly*. Vol. 28 (12), pp. A2-15.
- xviii. Parrott, N. and Marsden, T. (2002): *The Real Green Revolution, Organic and agro-ecological farming in the South*. Greenpeace. London, UK.
- xix. Peter B. R. Hazell (1992). The appropriate role of agricultural insurance in developing countries. *Journal of International Development: Vol. 4, No. 6, 567-581 (1992)*.
- xx. Pretty, J. N., Ball, A. S., Xiaoyun, L., and Ravindranath, N. H. (2002). The Role of Sustainable Agriculture and Renewable-Resource Management in Reducing Greenhouse-Gas Emissions and Increasing Sinks in China and India. *Philosophical Transactions: Mathematical, Physical and Engineering Sciences*, 360(1797), 1741–1761.
- xxi. Rajagopal, S. and Mathur, K., 2000: Women's empowerment through state benevolence. *Economic and Political Weekly* 35(33), 2908–2910.
- xxii. Ramachandran, V.K. and M. Swaminathan, 2002. 'Rural Banking and Landless Labour Households: Institutional Reform and Rural Credit Markets in India'. *Journal of Agrarian Change*, 2 (4): 502–44.
- xxiii. Rao, P.N. and K.C. Suri, 2006. 'Dimensions of Agrarian Distress in Andhra Pradesh'. *Economic and Political Weekly*, 41 (16): 1546–53.

- xxiv. Reddy, P. Krishna, and R. Ankaiah. 2005. A framework of information technology-based agriculture information dissemination system to improve crop productivity. *Current Science* 88:1905-13.
- xxv. Reddy, T. P., 2010. 'Distress and Deceased in Andhra Pradesh: An Analysis of Causes of Farmers' Suicide'. In *Agrarian Crisis and Farmer Suicides*, eds R.S. Deshpande and S. Arora, 242–63. New Delhi: SAGE Publications.
- xxvi. Roling, N. 1990. "The Agricultural Research-technology Transfer Interface: A Knowledge Systems Perspective." In *Making the Link—Agricultural Research and Technology Transfer in Developing Countries*, ed. D. Kaimowitz, 1–42. Boulder, CO: Westview Press.
- xxvii. Rosenzweig, M.R., and H.P. Binswanger. 1993. "Wealth, Weather Risk and the Composition and Profitability of Agricultural Investments." *Economic Journal* 103:56–78.
- xxviii. Sachs, Jeffrey. 2005. *The End of Poverty: Economic Possibilities for Our Times*. New York: Penguin Press.
- xxix. Stavenhagen, Rodolfo, 1977, 'Basic Needs, Peasants and the Strategy for Rural Development', in Marc Nerfin (ed.), *Another Development: Approaches and Strategies*, Dag Hammarskjold Foundation, Uppsala.

