



CHANGING CONCEPT OF AGRICULTURAL DIVERSIFICATION AND FOOD SECURITY: A THEORETICAL ANALYSIS.

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ABSTRACT

The present study begins with a discussion on the definitional and concept of Agricultural Diversification, Food Security. This discussion is further used to assess the indicators and measurement processes that are currently under use for assessing the condition of food security, and agricultural diversification, cereal can't alone support economic development notwithstanding the need to ensure food security to the people. In the context of state agriculture diversification has occurred across and within crop, horticulture and vegetable production (Kumar and Singh 2013).

Food security very complex phenomena which is constantly changing from time to time. It passes from one stage to another stage as the condition of food security becomes more and more severe. Thus, a variety of indicators are required for capturing various dimensions of food security.

KEYWORDS : food security, Agricultural Diversification, Horticulture, Fishing, Animal Husbandry

Introduction

Though there is lot of literature available on Agricultural Diversification and food security all across the globe and in India too. A lot of work has also been done by taking population growth and food security at international and national level. But the work taking both Agricultural Diversification, food security as an important aspect has been done at international level, at national (India) level and especially in Aligarh region, the indicator is still needed to be investigate because it provides information to strengthen the overall analysis taken under present study, and to provide information on another dimension.

Objectives

The present study tries to elucidate the definitional understanding of the concept, indicators and measurement of Agricultural Diversification and food security over past few decades. The study also highlights food security measurement methods on the basis of diet quantity and diet quality both that are currently under use for assessing the multidimensionality of food security and Present study also assesses the scope and need of these Agricultural Diversification and measurements with their advantages and disadvantages.

Agricultural Diversification

The concept of Agricultural Diversification conveys different meaning to different people at different levels. It involves movement of resources from low value commodity to high value commodity. It includes mainly Horticulture, Dairy, Poultry and Fisheries sector etc.



Prepared by Author

Fig 1

Another view is with respect to the National Economy, it generally conveys a movement of resources, especially labour, usually out of agriculture to industry and services, a sort of structural transformation in agriculture practices such as in cropping pattern, livestock rearing or in agricultural enterprises. The higher the competition among the farm activities the higher would be the magnitude of diversification and lesser competition leads towards specialization (Singh, 2006).

Diversification of Agriculture becomes unavoidable since growing of basic problems such as the small landholders are usually poor, undernourished and deprived and by and large practise subsistence agriculture with very restricted marketable surplus. Their plight calls for urgent need to augment their income for ensuring food security and alleviating poverty. Experiences gained in other developing countries suggest that Diversification of Agriculture towards high-value commodities and creation of non-farm employment opportunities has helped small landholders to augment their incomes and bail them out of the vicious circle of poverty (Ryan and Spencer, 2001).

The merits of Agricultural Diversification is soil improvement through crop rotation and with cultivation of legumes crops in any region which is highly dependence on rain fed cultivation where drought is common cause of food crises. (Stanslous, 2010).

The cultivation of high value crops give very high net returns and has made a significant impact on the income and employment levels of all the categories of cultivating households. Sharma (2011). Another view is that the cereal can't alone support economic development notwithstanding the need to ensure food security to the people. In the context of state agriculture diversification has occurred across and within crop, horticulture and vegetable production (Kumar and Singh 2013).

The Crop Diversification of Birbhum district of West Bengal with the help of a spatio-temporal assessment. He has found in great disparities in inter Block Administrative Units. Miserable backwardness of agricultural diversification in different blocks is because of hydro-physical, economic barriers, lack of cultural motivation and pro-active and post harvesting technological supports with associated cultivation technologies. The lopsided tendency of rice mono culture due to ignorance about the need of agricultural diversification is basically responsible for such situation, near future, Let (2011).

The issues of constrains in rain fed crop production in India, There is a need to further increase food production substantially for meeting the requirements of the ever-increasing population. This will put tremendous strain on natural resources which are already under stress due to unsustainable utilization. Continuous decline in groundwater levels, growing deficiency of major and micronutrients, declining factor productivity and looming threat of climate change are some of the issues which will have a bearing on food production in the near future. However, the large realizable yield gaps in many rain fed crops, opportunities to increase yields through rainwater harvesting and recycling, soil fertility improvement, crop diversification and effective dissemination of technologies give a hope that future requirements of food can be met, but it requires substantial resources. Venkateswarlu and

Prasad (2012)

The patterns of crop concentration and diversification in Vizianagaram District of Andhra Pradesh. The term 'crop specialization' indicates cultivation of less number of crops and crop diversification implies raising a variety of crops from the soil. **Appala Raju (2012)**

A study conducted to understand the integrated land use/land cover analysis of Surat District, Gujarat by using digital classification technique. They proposed that, land use and land cover assessment using satellite imagery provides reliable and accurate information, which is cost and time effective. It also offers a holistic view of large areas for better monitoring of land use and land cover occurrence and distribution. **Korade and Rakesh (2014)**.

The agricultural land resource utilization in Trans-Yamuna region in Allahabad District, Uttar Pradesh. According to this study, Indian agriculture occupies a prominent place not only because it supplies food to the people, raw materials to the industries and various items of export trade, but also because it constitutes an integral part of our culture and tradition and the general fabric of life in the country. **Mishra and Pankaj (2015)**

In the Indian context, crop diversification has many prospects that may prove to be of paramount importance in meeting the challenges arising on account of post green revolution scenario. In view of shrinkage of agricultural land and operational holdings due to expansion of urbanization, change in food habit of people, geometrical population growth rate, farmers do not have any other option except to diversify the agriculture system.

Stages of Agriculture Diversification

According to **Chaplin, 2000** the Agricultural Diversification pass through four different stages.

- First stage the cropping pattern shifts from monoculture to multiple cropping.
- Second stage the farmers start more than one enterprise.
- Thirdly, initiation of mixed farming.
- In the fourth stage of diversification the activities which are incorporated are beyond the agricultural domain such as adding the value through the processing, packaging and producing by products e.g. Cheese, jam, etc.

Why Agriculture Diversification is Necessary?

There is need to increase agricultural diversification because of the following reason

- Adding up value
- Shifting consumption pattern
- Improving food security
- growing income
- Stabilizing income over seasons
- Generating employment
- Eradicate poverty
- Improving productivity of scare resources
- Promoting export
- Improving environment

Determinants of Agriculture Diversification

As the physical and socio-economic factors are the most important in controlling the agricultural practices in any region, so the study of determinants of agriculture diversification enable us to know the dominating factors in a particular region which control the agriculture practice. Moreover, it helps us in knowing the contemporary competition among crops (**Bhalsing, 2009**). There are a number of factors determining the course of agricultural practices. Forces that drive agricultural diversification in a particular socio-economic set up may be different in another set up. (**Jha, Tripathi and Mohanty, 2009**).

Broadly these factors may be categorised as:

- Environmental factor, such as Rainfall, Temperature and soil Fertility
- Agro climatic condition,
- Soil
- Labour facility
- Facilities of irrigation
- Technological Factors
- Institutional infrastructure factors : Price Factors market infrastructure

Application of *fertilizers* input is recognized as one of the quickest ways in boosting agricultural production, the provision of fertilizers at reasonable costs and at all suitable time is an essential requirement for the development of agriculture (**Champa, 1976**).

As we know that India is a labour abundant country and therefore labor using input should be preferred. High Yielding Varieties of seeds are capable to increasing production, and planners also realize that production of quality seed will continue to be an important input for crop production strategy (Five year plan, 1978-83).

An improved variety of seeds is an essential ingredient on the recent green revolution and rightly named as miracle seed (**Sadhu and Mahajan, 1985**). The In 1960-61, a package project in seven Intensive Area Development Programme (IADP) district were experimented. These areas were such which had an assured supply of irrigation and were free from natural hazards. The IADP district showed 25.53 per cent high yield than non-IADP. In some case it was 50 per cent agricultural area under High Yielding Varieties of seeds is in great increasing. A considerable amount of increase in area under High Yielding Varieties of seeds of Wheat, Paddy, Maize, Jowar and Bajra have been reported every year. The highest area under wheat and lowest area under Jwaar was reported. For most traditional varieties of wheat and rice, fertilizer responses fall at about 40 to 50kg of nitrogen per hectare. In India recommended fertilizer doses for the Mexican wheat are 80 to 120 kg nitrogen, 40 to 60kg P₂O₅ and about 40kg K₂O per hectare (**F.A.O. UN, 1969**).

Due to inadequate rainfall, farmers could cultivate only one crop without irrigation in limited period. Therefore irrigation development and improved water management are crucial to India's agricultural development. The accelerated growth in production is possible only through increased multiple cropping and realization of higher crop yield per unit area, both of which are heavily dependent on irrigation (**Roy, 1979**).

Modern agriculture machines are very powerful tool which can bring great benefit by appropriate and timely use. Mechanization has increased the yield of crops, in case of timely preparation of the ground seeding cultivation and harvesting (**Salmon and Hanson, 1964**). Institutional factors play an important role in development of agriculture. The institutional factors include land consolidation, credit supply, co-operative society and size of land holdings. All these factors play a very significant role in development of agriculture.

Krishna (1992) pointed out in his paper, that agricultural development, in true sense, denotes the quality of agricultural system of a region in terms of productivity, diversification and commercialization consistent with desired state of agrarian relation and ecological balance.

Concept of Food Security

Food Security thus in true sense which is derived from the Latin word secure means free from care and anxiety and hence implies not only access but right to food. Food Security not only implies availability of food but also its access which is possible by Purchasing Power. The fact is that the world produces enough food

to feed everyone but it does not solve the problem of hunger and starvation. It is a question of not only production but attacking the underlying factor that causes hunger. The issue is further compounded by regional disparities and most importantly individual family or intra household food situation. Even within a household women face the burden of chronic malnutrition as they are affected by age old gender discrimination (**Ghosh 2000**). The vision of free from hunger is easy to think but too difficult to implement. There are mutilator's involved in the entire chain of food from food production and sustainability to Food Security, storage and its distribution at household levels, including food availability, purchasing power etc. Food Security at household level can be achieved only when all people of a household at all times have access to sufficient food for health and production. Thus the issue can be divided into three main components i.e. food production and food availability, food access at household level and food utilization by the poorest people (**Mathur, 2000**).

According to the Organization for Food and Agriculture (FAO) of the United Nations, food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for active living and healthy life.

According to the European Crop Protection Association, food security often refers to food availability and an individual's success to food. A person can be considered "food secure" if they do not live in hunger or fear of starvation. In addition to hunger and starvation, food security can also refer to the availability of a sufficient nutrition to ensure a healthy diet, avoiding the health impacts of malnutrition.

According to the Department of Agriculture of the United States, "Food insecurity is a situation of limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways."

Food Security During 2000s recurring food crises necessitate to include Stability as one of the main components of food security but during 2010s, Evidence of increasing malnutrition among the children/Females led to inclusion of Nutrition also as an essential element of food security.

Now food Security means five things:

- Food Available in the country
- It is necessary to people, physically and financially
- People are healthy to absorb it
- Food price and supply are stable over period
- And last but not least it is nutritious enough to sustain a human body

MS Swaminathan (2011) has suggested a package of measures to ensure food security to all as below.

1. Revisiting international trade rules, in order to promote a "food security oriented" trading system.
2. Creating a better market information system, inclusive on the level of stocks, to help restore confidence in international markets.
3. Tightening up speculation on the futures market to avoid price manipulations.
5. Reducing food waste and post-harvest losses and ensuring food safety.
6. Increasing investment in ever-green agriculture and in agricultural research.
7. Giving greater attention to the net income of smallholder farmers.

Parchi Mishra (2013) points out that one needs to take into account not only the cost of the food subsidy but also the costs of

setting up or running new institutions and bureaucracies, and the costs that are likely to arise if there are political pressures to protect the existing beneficiaries. There are still more imponderables, and the final cost could add up to much more than what is now estimated. According to **Deepa Sinha (2013)** a number of independent estimates have been made of the cost of implementation of the National Food Security Act. However, these estimates are either based on wrong assumptions or work with numbers that are not in the public domain. The one thing that most of them share is an attempt to demonstrate that the costs will be unaffordable.

Pillars of Food Security

To assess of food security four pillars have been identified by FAO. These four dimensions can easily be extracted from the FAO's Definition of food security given during World Food Summit of 1996 held in Rome.

- **Food Availability:**

Food availability is meant by the physical existence of food either from own production or from the market. At the national level, food availability derives from the combination of domestic food stocks, commercial food imports, food aid and domestic food production.

- **Access to food:**

It is ensured that all households and all individuals within those households have sufficient resources to obtain appropriate food for a nutritious diet. It depends on the level of household resources (capital, labor and knowledge), food prices and the existence of social safety net. Therefore, adequate access to food can be obtained without being self-sufficient in food production. More importantly, it is the ability of households to generate sufficient revenue, which, with its own production, can be used to meet food needs.

- **Use and utilisation of food:**

Use requires not only an adequate diet, but also a healthy physical environment, including availability of adequate drinking water and sanitation (to prevent disease) and an understanding of proper health care, food preparation and storage processes. In addition, the ability of health care, behavior and practices are equally important. According to United Nations Economic and Social Commission for Asia and the Pacific UNESCAP (2006) 148 million people who struggle daily to get drinking water live in rural India.

- **Stability of food security:**

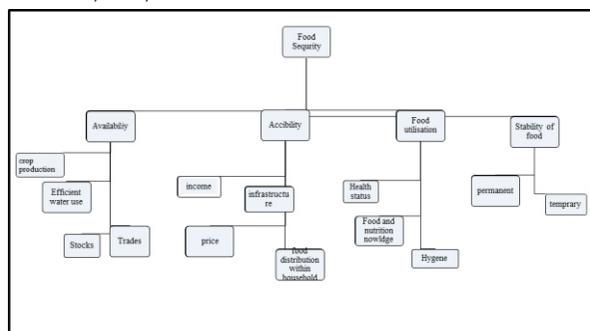
Stability refers to the time dimension of food security. Distinction can be made between chronic food insecurity (permanent) and transitory food insecurity (temporary).

From the beginning of human civilization food security, in their wide ranging scope, it is closely interlinked with each other. It has been acquiring distinct elements in different times. But it never lost its importance despite, technological advancement. And, that is why it has attracted various scholars to approach these problems from various angles. These approaches explain the problem and causes behind food security (**Jha, 2003**).

A hungry man is an angry man. But when his anger is further heightened by a feeling of frustration and domination, it is our view that the primary consideration becomes the need to liberate himself; and the violence that will be generated in the process can be really disastrous (in a speech delivered to a plenary session on 17th June 1970 by Joan Danquah, member of the National Youth Council of Ghana). Food is the first requirement of every individual and right to food is the birth right of all the people and it should be an integral part of the right to life. But for millions throughout the world, that need for food is not met and that right is denied and intolerable (**Danquah, 1970**).

According to the Universal Declaration of Human Rights adopted on 10 December 1948 under Article 25, "Everyone has a right to a

standard of living adequate for the health and well being of himself and of his family including food, clothing, housing and medical care and necessary social services and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control" (The Europa Year Book, 2007).



Source: FAO 2010

Fig 2

The concept of food security gets enforced legally and socially, hunger will continue. During 1974, Food and Agricultural Organization (FAO) had declared that by 1984 no child, women or man should go to bed hungry and no human being is physical or mental potential should be stunted by malnutrition (Patel, 2011). Food security simply means the absence of hunger or to provide sufficient amount of food to the people. Food security in its simplest sense means, that enough food is available at global, national, community or household level (Anderson, 2009). Food security today is the most heated and debated topic of the world. The need for the assessment of food security has been given attention by global events in the recent past. The phenomena s like population growth, shifting consumption pattern, rising food prices, natural disasters and high profile reports on the climatic change have resulted in media organizations, policy makers, international agencies and non governmental organizations towards devoting attention to the complex issue of food security (McDonald, 2010).

Everyone has the right to adequate food in a quantity and quality sufficient to satisfy their dietary needs. One of the key challenges going forward is to shine a light on food quality, to address hidden hunger (Grebmer, 2014).

The policy makers, planners, researchers and decision makers all over the world, have been exploring ways and means to ensure food security to the millions of citizen (Tripathy, 2011). When one talk about food security then it is meant that, food is easily available and the people have access to food at all the times in a safe and nutritious form to meet their dietary requirements and food preferences for an active, healthy and productive life (Sharma and Bordoloi, 2008). Hunger remains an enormous problem throughout the developing world, despite the fact that Government all across the globe has recognized food security as a fundamental right of the citizens of their countries (Shein, 2007). On the basis of vast literature available, it could be said that there are numerous ways to assess the condition of food security, each measuring different aspect of food security at different level.

Dietary quality is an indicator for food security, as it provides a numerically capable indicator to strengthen the overall analysis of the survey, and to provide information on another dimension of household food security on the basis of variable of dietary diversity and percentage of food energy obtained from staple foods (FAO, 2007; Smith and Subandero, 2007; Hoddinott, 1999 and Kennedy et al., 2011). In some countries it has been established that many nutritional problems are not the result of lack of calories, but rather a lack of diet quality (Ruel, 2003)

Food security is an integral part of food system in a country, which cannot be maintained without price stability (Shafi M, 1987). The

objectives and concept of Food Security is not restricted to the boundaries of country alone. It is a global problem should be treated at the International level because no country of the world can become self sufficient in all the basic and non basic food items. Therefore different ways and mean should be adopted to fulfil the objectives of Food Security at a global level and the surplus of one region would go a long way in meeting the demand of deficit of regions (Mohammed A 1995).

It is estimated that about 340 million of people in the World are chronically under nourished and unable to grow or obtain enough food to lead a healthy and active life. An essential element in the Food Security in the Developing countries is to ensure the social security at one hand, where on the hand is the nutritional need of the people may be satisfied. Adequate food may be produced in the country but unless these people have the purchasing power they cannot have access to the food reserves (Shafi, M. 1992).

Conclusion

From the above discussion it can be concluded that, the concept of Agricultural Diversification and food security is multidimensional and complex Phenomena hence, while measuring it, a set of indicators has to be taken into consideration on the basis of information or data researcher wants to extract. Since, it is dynamic it is a subject of changing interpretations, measuring food security becomes a tough task especially when it is measured at individual and household level (Maxwell, 1995). One of the main disadvantages related to the measures of food security is that there are many gaps because to a certain extent the data is not available and for regions the data which do exist are not always comparable. It is important that the studies of prevalence should be extended and that the same criteria should be used everywhere. This will make studies comparable (Frongillo, 1999) and because studies can be compared, this comparison will provide a better way to draw or to reach out for a refined or sorted conclusions. This common conclusion will provide easiness to take decision and actions for improving food security or improving those dimensions of food security which are under study.

Going through the present study it can be deduced that the concept of food security has come a long way going through many paradigm shift in its concept indicators and measurement from food availability, accessibility, stability, utilization, social acceptability, risk, vulnerability and sustainability. The concept has also shifted from quantitative approach to qualitative approach which measures food insecurity directly and is economic in nature. Further the concept shifted to certainty and acceptability which are psychological and social in nature based on people's perception of food insecurity. Some measures capture a certain dimension of food security and some captures other dimension but no single measure is suitable for measuring food security as a whole alone. So there is a wide area still left for further research to be conducted with an intention to discover an appropriate measure that can be used in diverse settings across the world, even within countries and that can capture maximum possible dimensions of food security for a better understanding of the problem so that better plan of action, policies and programmes can be implemented for eradicating food insecurity. It is also very important that the researchers, policy makers, governmental and non-governmental organisations must give their time and resource in learning more about the process of developing tools that provide valid and reliable measures of food security (Melgar-Quinonez & Hackett, 2008).

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