

IMPACT OF CHEMICAL APPLICATION ON INDIAN AGRICULTURE

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Abstract

Green revolution stressed on the use of chemicals and machines in order to increase agricultural production. This paper is an attempt to look at the impact of chemical components of green revolution. It is quite relevant to explore the impact of chemical fertilisers and pesticides on production of food grains in growing economy like India. Study estimates the amount of chemical applied in Indian agriculture to compare the application of chemicals used especially fertilisers with other countries of world both belonging to developed and underdeveloped category. Study has proposed the ways to substitute the use of chemicals for sustainable development.

I. Introduction

Food is the most important component of life. After independence India was facing the problem of hunger (Amit Kumar, Damodar Saur and Bimal Kishore Sahoo, 2018) and in order to sort out the same it had to accept the food aid of PL 480 given by America. It should however be pointed out that this aid was not forever, India had to take steps to sort out the problem of imbalance between demand and supply of food. It adopted the method of intensive cultivation to sort out this imbalance. Green revolution was adopted as a solution to the problem of hunger. It encouraged the farmers to use chemical fertilisers, insecticides and HYV seeds in order to increase production of food grains. Only due to it, India achieved self-sufficiency in food production and in 2012 became the largest exporter of rice (Pritchard et al 2013 & Chandrasekhar, 2012). It had a stock of 65.8 million tons of food grains with FCI as a buffer stock in 2014-15. No doubt it led to increase in food production but it was not sufficient because still there is food insecurity and malnutrition in India and almost 25 percent of the population is below poverty line (Food and Security analysis, GOI-2019). Here it appears that there is a competition between food grain production and population. Population is victorious over agricultural production. Now, the question arises when there is an increase in food grains then why there is malnutrition persisting in spite of all the efforts taken by Indian Government since independence. There can be two reasons for this mismatch, first one is the difference between the growth rate of population and food grains, pace of population is geometric as compared to arithmetic rate of food grains (Thomas Robert et al 1986) and the other reason can be that the inputs applied in green revolution may not be effective in sorting out the problem of ever increasing demand of food grains.

II. Research Objectives

In the above background and research problem, the study would be based on following broad research objectives.

1. To study the amount of chemical applied in Indian agriculture.
2. To compare the application of chemicals used especially fertilisers with other countries of world both belonging to developed and underdeveloped category.
3. To explore the ways to substitute the use of chemicals.

III. Review of Literature

With above research problems and objectives thematic review of literature is conducted to understand the amount of chemicals used in India as compared to other countries, related issues, and possible remedies.

Agriculture in India plays a significant role in not only food production but also employment generation. Almost 60 percent of Indian population is dependent on agriculture for their livelihood (financial express 2018). Therefore, there are many studies which are done on different aspects of Indian agriculture. R. S. Deshpande and Saroj Arora (2010), focussed in an edited book on the reasons of growing agrarian crisis and incidence of farmers' suicides in specific regions of India. It deals with not only the theoretical aspects but also with the practical aspects as the chapters are contributed by not only administrators but also the academicians from different parts of the country. D. Narsimha Reddy and Srijeet Mishra (2010), focuses on agricultural crisis of India. It throws light on all factors associated with the agricultural crisis. It analyses in detail the structural and institutional policies for agriculture in India. K. Samand Chandra, V. Suresh Babu, Pradip Nath, (2013) deals with the problem and solution of agrarian crisis in India. It analyses various factors like inadequate irrigation facility, lack of cheap agricultural credit, use of modern technology etc. in detail. Lakhwinder Singh, Kesar Singh and Rakesh Sharma, (2016) deals with the agricultural crisis as the cause behind the farmers suicides in India. The book throws light on the use of technology as one of the causes of suicides in State of Punjab.

Raman et. al. (2017), in a comparative analysis of crisis index of Agriculture of Uttar Pradesh and other States of India. The issues taken for calculating the crisis index are profitability, rural indebtedness etc. (Mozner, et.al. 2012) deals with the environmental effects of agriculture on the marginal yield. It deals in detail about the effect of fertilisers on the productivity of soil. (Patra et.al 2017) deals with effect of disproportionate use of chemical fertilisers on productivity in Hooghly.

There are many studies on agrarian distress in India dealing with several causes of agricultural distress. One of the major causes of agrarian crisis is the application of industrial input in Indian agriculture. These inputs include chemical fertilisers and pesticides, HYV seeds and machines. Present paper is an attempt to investigate the impact of chemical application i.e. fertilisers and pesticides on agricultural production.

IV. Research Gap

In Indian context no such study is found to the best of researchers' knowledge suggesting the remedial model by exploring the comparative position of chemicals being used in India in agriculture leading to critical socio-economic and health issues.

V. Research Methodology

The paper is based on secondary source of information. The data is collected from various economic surveys, reports of CACP, reports of Agricultural Statistics at Glance. The data so collected is presented in form of tables and diagram. Various statistical tools like average, percentage and regression are used for analysis of the data collected. The paper aims to study the impact of chemical application in Indian agriculture. It focuses on the amount of chemicals in the form of fertilisers and insecticides being used for crop production in India. Since the sustainable production is difficult to be estimated therefore a comparison needs to be made regarding chemical application of different countries belonging to both developed as well as developing part of world. It aims to explore the impact of chemical use on the farming community.

The paper is divided into three sections I section deals with the amount of chemicals used in Indian agriculture. II section focuses on the comparative analysis of various countries belonging to developing and developed countries regarding the use of chemicals, especially fertilisers. III section throws light on the effect of fertilisers and insecticides on Indian agricultural production and concludes with the suggestions and recommendations for sorting out the problem.

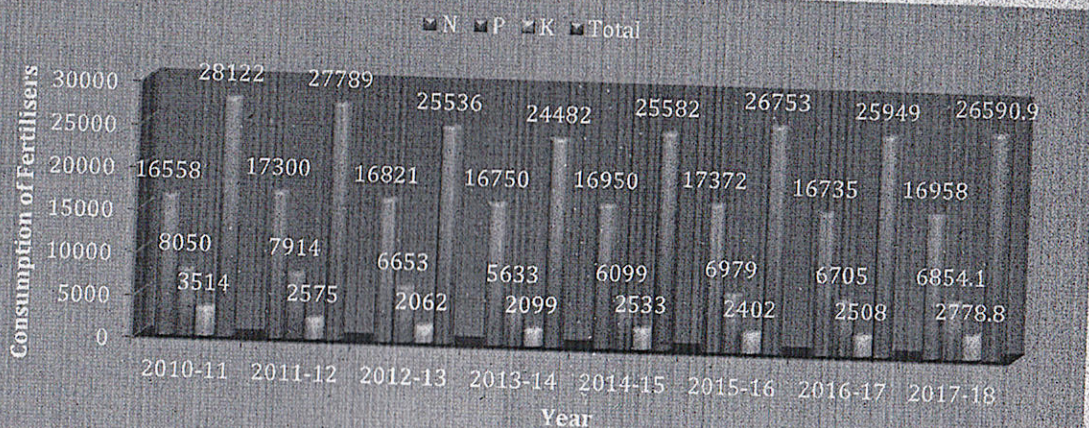
VI. Analysis and Discussion

1. Application of Chemical in Indian Agriculture

Agriculture is facing a pressure of increasing production as well as productivity as the world population is increasing at a great pace (SK Goyal, prabha.J P, Rai,R Singh, 2016). As a result of it, food production must be increased keeping the size of land the same because there is a competition between urban interest and the rural interest. Here the urban interest means industries while the rural interest means agriculture leading to decline in

per capita land availability (Kaushik Majumdar, Adrian M. Johnston, Sudarshan, Dutt, T. satyanarayana and Terry L. Roberts, 2013). The only way left with the agriculturists is to adopt intensive method of cultivation i.e application of chemical fertilisers, pesticides, and quality seeds. The farmers after adoption of green revolution started applying chemical fertilisers and pesticides to increase food grains in the desired quantity.

Diagram - 1 Consumption of Fertilisers in India (000 tonnes)

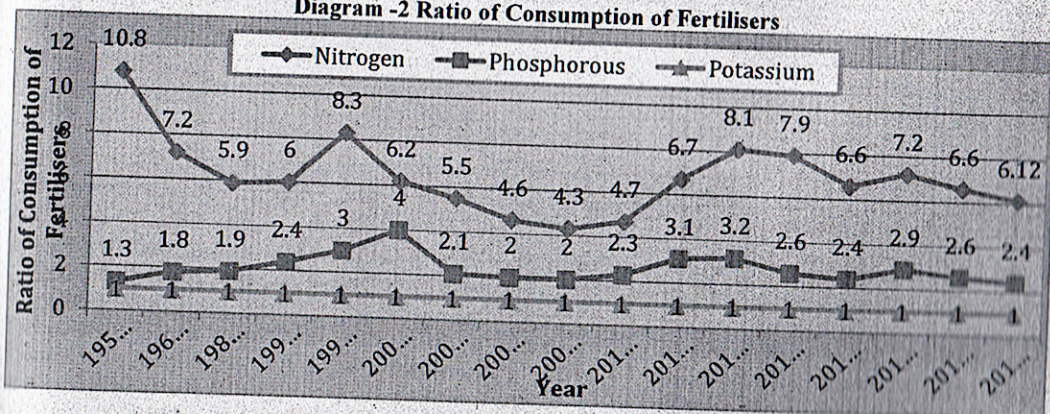


Source: Fertiliser Association of India, Also See CACP report, p. 63, *Agricultural Statistics at Glance*, p.312, 2018

It needs no emphasis that continuously cultivating a land leads to absorption of the nutrients from the soil. Therefore, in order to keep the fertility of land intact chemical fertiliser are applied. Diagram - 1 shows the level of fertiliser consumption in India. The total application of fertilisers in 2010-11 was 28,122 thousand tonnes which declined to 24,482 thousand tonnes in 2013-14. In 2014-15 the consumption stood at 28,122 thousand tonnes which declined to 25,949 thousand tonnes in 2016-17. Application of any chemical in right quantity is good for the land but use of chemical fertilisers indiscriminately is not good for the health of soil (Hudak, 2000; Hanson, 2002; Almasri and Kaluarachchi, 2004). Use of more fertiliser leads to loss of soil nutrients instead of any kind of gain and more over it is a kind of theft on the future generation who is not present there to defend themselves (A. Howard, 2003).

The more dangerous thing is the use of fertilisers disproportionately. Being inspired by the increased production in green revolution, farmers in India started applying fertilisers indiscriminately. Application of more fertilisers in Punjab and Haryana led to killing of good worms and micro-organisms in soil which made the productivity stagnant (Kumar and Singh, 2010). Largely the cause behind this is the disproportionate application of fertilisers by the farmers due to the increased demand for food grains and inspiration to earn more profits. Therefore, mere looking at the increased use of chemical fertilisers is not enough, composition of application is equally important. Diagram - 2 shows the chemical composition of chemical fertilisers used in India.

Diagram - 2 Ratio of Consumption of Fertilisers



Source: *Economic Survey Government of India, Ministry of Finance, 1998-99, 2006-07, Department of Fertilisers, Ministry of chemical and Fertilisers, 2018*

Nitrogen, phosphorous and potassium are the important component which are needed by the plants to grow. Mostly the application varies with the type of soil. In Indian condition the requirement is 4:2:1. It should however be pointed out that the application of fertilisers should be done in the right proportion, time, amount, and method (Jaga and Patel, 2012). Excessive use of fertilisers leads to spoiling of nearby water body due to the wash off chemicals in the water bodies. As a result, oxygen in the water gets reduced. Depletion of oxygen leads to killing of aquatic animals and plants (Harrison et al, 2002). Diagram - 2 reveals that in 1955-56 the ratio of application was 10.8: 1.3:1(NPK), in 1980-81 the position was a bit better as the ratio of the use of the fertilizers was 5.9: 1.9:1. In 2008-09, it was used in the ratio of 4.6:2:1 but again it increased to 6.7:3.1:1 in 2011-12. In 2012-13 the ratio was as high as 8.1:3.1:1 but happily it declined to 6.6:2.6:1 in 2016-17. In the above-mentioned period, application of nitrogenous fertilisers is the maximum, potassic and phosphatic fertilisers are used in more or less correct proportion. More use of nitrogenous fertiliser leads to acidification of soil due to which there is decline of organic matter in soil (Velthof et al., 2011). Application of imbalanced application of fertilisers ultimately leads to decline in the vitamins and nutrients in the in-food items (Das, et al., 2009) & (Suman Patra 2016) that means application of fertilisers is neither good to farmers nor to consumers. It has been pointed out by planning commission that due to pressure of increased production on the same or more area and depletion of micro and macro nutrients in soil forced the farmers to use more fertilisers (Planning Commission of India 2011). It was felt by the steering committee of planning commission that since the nitrogen fertilisers were subsidised more therefore are used more than the desired ratio (Economic Survey, 2007-08). Though Government has changed the policy from subsidy to nutrient based subsidy. Even the new policy was not able to change the producers' choice. Further, in order to encourage the desired application of fertilizers, a new concept of customized fertilizers which are both soil and crop specific, has been used by the Government. Organic fertilizers namely city-based compost and vermin compost and bio fertilizers namely rhizobium, azotobacter, azospirillum and phosphate solubilising bacteria have been recognized and incorporated in the Fertiliser Control Order (FCO) 1985. Satynarayana et. al. (2012).

2. Comparison of Application of Chemicals used with Other Developed and Underdeveloped Countries

Second part of the analysis is based on the critical comparison of chemicals being used India to increase the production and the effect.

Table: 1 Fertiliser Consumption per Hectare of Agricultural Land in selected Countries

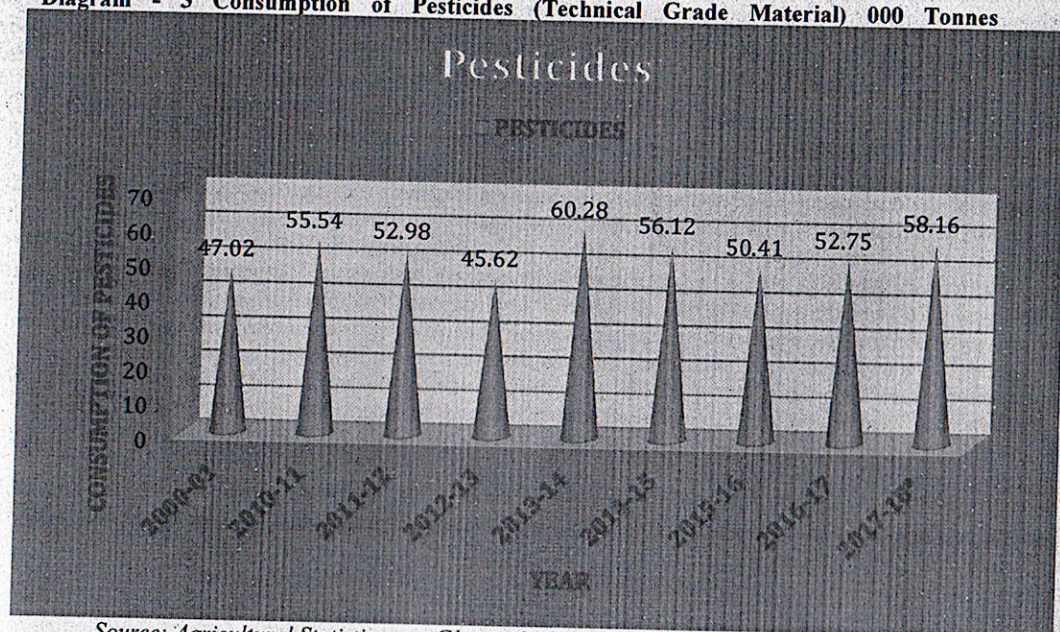
	2014				2015				2016			
	N	P ₂ O ₅	K ₂ O	Total	N	P ₂ O ₅	K ₂ O	Total	N	P ₂ O ₅	K ₂ O	TOTAL
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
USA	29.1	10.0	10.9	50.0	30.0	10.6	11.8	52.4	29.0	10.4	11.8	51.3
Canada	39.5	14.5	6.1	60.1	40.5	16.4	6.0	62.8	38.7	15.5	6.7	60.9
France	76.3	14.2	15.9	106.4	77.0	14.9	12.9	104.8	78	12.5	13.6	104.1
Bangladesh	145.2	66.7	47.8	259.7	137.2	70.5	49.7	257.4	131.5	68.2	51.0	250.7
China, Main	48.9	29.6	15.9	94.4	52.5	22.9	18.9	94.4	49.4	22.5	18.7	90.6
India	94.4	34.0	14.1	142.4	96.7	38.8	13.4	148.0	93.1	37.3	14.0	144.4
	(85.4)	(30.7)	(12.8)	(129.0)	(87.6)	(35.2)	(12.1)	(134.9)	(84.4)	(33.8)	(12.6)	(130.8)
Nepal	25.7	11.4	0.5	37.6	25.9	7.2	0.7	33.9	3.6	0.2	-	3.8
Pakistan	91.4	26.9	0.9	119.3	73.8	27.8	0.6	102.2	101.2	34.4	1.1	136.8
Sri Lanka	72.7	26.9	33.2	132.8	88.4	25.3	38.6	152.3	55.0	11.5	18.8	85.3
UK	60.8	11.6	15.8	88.2	59.9	11.4	15.8	87.1	60.8	11.3	16.3	88.4
Australia	3.5	2.3	0.6	6.3	3.7	2.6	0.7	7.0	4.1	2.4	0.7	7.2

Source: Agricultural Statistics at a Glance 2017 and 2018

It needs no emphasis that application of fertilisers is related to underdevelopment and poverty. In an underdeveloped country use of fertilisers is more as compared to developed countries (FAO, 2006). The reason behind it is that underdeveloped countries must support more population with limited resources as compared to developed ones. The problem is more critical in countries like India which must support almost 16 percent of the population of world with 2.5 percent area (UNEP, 2001). That is why it has its focus on intensive cultivation and therefore led to use of more high yielding variety seeds instead of traditional ones which require larger amount of fertilisers and water. As is visible from the above Table: 1 the fertiliser consumption was 60.1 Kg/hect in Canada in 2014 which increased to 60.9 in 2016. In France it was 106.4 Kg/hect which declined to 104.1 Kg/hect in 2016.

17. In UK it was 88.2 Kg/hect which increased to 88.4 Kg/hect in 2015-16. The whole world taken together used 37.1 kg/hect fertiliser which increased to 38.1 Kg. In 2014-15 India consumed 142.4 Kg/hect which increased to 144.4 in 2016-17. Application of excessive fertilisers not only damages the soil profile but also is a major cause of decline in profits of the producers (cropnutrition.com, 2018).

Diagram - 3 Consumption of Pesticides (Technical Grade Material) 000 Tonnes



Source: Agricultural Statistics at a Glance, 2018, p. 310

One of the causes of increased cost of production for the farmers and damage of soil quality is use of pesticides. Diagram - 3 shows the trend of consumption of pesticides, the consumption was 47.08 thousand tonnes in 2000-01 which increased to 57.25 thousand tonnes in 2016-17. During a period of 16 years farming in India experienced a hike of 21.60 percent in use of pesticides. It is very harmful for the whole eco system. Pesticides should be used in correct proportion then only it is less risky. Consumption of pesticides no doubt secures the crops from various pests but at the same time it leads to air and water pollution (Agarwal et. al, 2010). Majority of the farmers are very less aware about the seriousness of impact of pesticides on health of humans and soil. They are ignorant about the types, level of poisoning and safety measures to be taken towards pesticides. For them Pesticide is only an input which can protect the plant (Sharma et.al, 2012). It needs no emphasis that food is taken to increase energy levels in human body, but it has now become a medium of transferring pesticide into human body which is fatal for human health (Hayo and Werf, 1996).

Regression Result

R	0.868			
R square	0.753			
Adjusted R Square	0.718			
SEE (Std. Error of the Estimate)	15.70961			
Coefficients				
	Unstandardized Coeff.	Standardized Beta	t	Sig.
(Constant)	52.843	-	1.778	.097
Fertilizer	4.398	.603	3.820	.002
Pesticides	1660.333	.378	2.391	.031

It can be easily understood from the above analysis that application of chemicals in the form of fertilisers and insecticides are dangerous for the eco system as whole, but at the same time producers apply it to produce more. Therefore, relationship between production and application of chemicals i.e. fertilisers and insecticides, need to be analysed. To understand the relationship between dependent variable food grains (million tonnes) and independent variables pesticides and fertilizers (000 Tonnes) a multiple regression approach was adopted in sample. The data of food grain production and fertilisers& pesticides was taken for a period starting from 2001-

02 to 2016-17 from Agricultural Statistics at a Glance. About 75% of variations in food grains was found to be explained by selected independent variables ($R^2=0.753$). The adjusted $R^2=0.718$ also showed evidence of good fitting of regression model. The independent variable fertilizer was found to be positively related with food grains and this relation was statistically significant at 5% level of significance. Pesticide was also positively related to production but was not statistically significant. This analysis highlights that 1 percent increase application of fertilizers and pesticides will lead to an increase of 0.7 percent food grains. That means, though the production of food grains are increasing with application of fertilisers and pesticides but not in the same ratio. It can be understood that these chemicals should be substituted easily with any input which is more productive than these inorganic inputs.

3. Exploring Ways to Substitute the Use of Chemical

Third part of the analysis is based on exploring the way out for this issue. There needs no emphasis that the productivity of soil depends upon the composition of minerals, drainage facilities, organic matter, presence of earthworm and microbes (Suman Patra., Pulak Mishra, S. C. Mahapatra, S. K. Mithun, 2016). It should however be pointed out that the soil containing optimum nutrients along with assured irrigation leads to increase in production by 200 to 300 percent (Hegde et al, 2000). Application of chemicals disproportionately spoils the productivity of soil. It is proven that unjustified application of chemicals has even converted the fertile lands into barren ones. Soils of Punjab and Haryana has shown indication of infertility (Maredia and Pingali, 2001). One cannot deny the fact that productivity of Indian agriculture is declining day by day and ultimately it will affect the total production. Therefore, a second green revolution is required, in order to deal with the problem of declining productivity. The conversion from inorganic agriculture to organic one will definitely deal with the food problem, high energy cost, underground water contamination, soil erosion, low productivity, low farm incomes and risk to human life. In America, in 1980, the Department of Agriculture (USDA) estimated, that between 20,000 to 30,000 of the farmers practiced non-conventional (organic agriculture) agriculture which formed one percent of the total population. Now the figure has doubled or trebled. Farmers who practiced nonconventional cultivation, reduced the use of chemical fertilisers and pesticides and lesser mechanical energy, have reported that their cost of production is lower than their nearby farms who used chemical fertilisers, insecticides and mechanical energy (John et. al. 1990). In early years, their production was lower as compared to other farmers, but the loss was compensated by the lower cost of production which ultimately led to higher net profits.

It should however be pointed out that soil is not an instrument like pesticides, fertilisers for increasing crop production but is a complex living organism which should be protected and nurtured to ensure long term productivity and stability. Earlier, the farmers in developing countries like India used to increase production by increased application of fertilisers, insecticides, irrigation etc. Increased application of all these inputs cannot be used indefinitely. It can give good results in the short run but not in the long run, especially when chemicals are used disproportionately. It has been proved that the productivity of Indian agriculture is declining. Therefore, it is high time to take up some steps to control the damage. Farmers need to practice a new agricultural system in order to manage the nutrients of land sustainably. In developed countries where the problem is surplus food grains, there, managing nutrients of land will not be a problem because they have ample amount of food grains as compared to demand and the reduction of production to some extent will not have a bad effect on farmers. The problem is of developing countries where the amount of food grains is less than the demand. The farmers are reluctant to change the techniques as they have small holdings and so the risk involved is more as compared to their developed counterparts. One main reason is that in developed countries, the farmers are in the position to control chemical application and use organic matter for making the agriculture sustainable because the climate supports them. The farmers belonging to developing countries like India, having tropical climate, face more difficult situations in managing their flora and fauna (Donald L et. al. 1995). The challenge is also due to the poverty of the farmers. For them, short term profit is more important than long term benefit in view of loans taken for seeds, fertilisers etc. from unorganised sector and instant returns are essential to pay the loan off. Moreover, high temperature and heavy rains, make it difficult to protect land and water. Such climate makes it difficult to safeguard the land from various diseases resulting from the use of organic matter. The diseases require more and more application of chemicals

Therefore, India should research on the challenges to organic agriculture. More researches should be undertaken to understand biology and ecology of tropical farms. The relation between crops and pathogens can be studied that will suggest various ways to avoid the pests without the application of all the prevalent chemicals. These researches may bring out a method which may lead to a decline in the output for some years (John P et.al. 1990). It should however be pointed out that in view of sustainable agriculture, the Government should take the initiative in encouraging farmers to adopt sustainable practices rather than industrial practices. Although the Government is encouraging the use of organic manures and pesticides instead of chemical fertilisers and pesticides, but it is not enough. It needs no emphasis that nitrogenous fertilisers play a key role in soil fertility (Dey and Sekhon, 2016).

One estimate has put the total requirement to 2.6 million tons of mixed nitrogen a year (Randhwa 1958). Farmyard manure is one of the methods through which the nutrients can be provided to the land. Average farmyard manure has 0.3 percent nitrogen, 0.2 percent phosphoric acid and 0.30 percent potash. On the other hand, manure with no fodder mix has 0.5 to 5 percent of nitrogen, 0.4 percent to 4 percent phosphoric acid and 0.5 percent to 9 percent potash (Daji, et. al.1962). It has been estimated that the cattle shed manure supplies 10 times N and P₂O to the soil as compared to other manure and fertilisers taken together (Mamoria, 2003).

The second source of manure is village and urban compost. In rural areas, all type of wastes can be very easily converted into manure by the efforts of the farmer himself. The problem is of urban areas where urban compost is made of municipal wastes and night soil. This compost should be prepared by municipalities. Town compost contains 1.3 percent nitrogen, 1.1 percent phosphoric acid and 1.5 percent potash. Treatment of sewage gives sludge. The composition of sludge is 30 percent nitrogen, 2 percent phosphoric acid and 0.5 percent potash (208). The municipalities always face lack of funds to manage their expenses. Making manure will not only generate revenue for them but also clean the city. One of the sources of manure is animal wastes from slaughterhouses. Dried blood contains 10 to 12 percent nitrogen, 1-3 percent lime, horn turnings and shavings contains 10 -15 percent nitrogen, bone meals contain 45 -55 percent nitrogen, 3 percent calcium carbonate and 4 percent silica. fish manures (are the by-products of fishes) contain 4-10 percent nitrogen, 3-9 percent phosphoric acid and 1-2 percent potash (Mamoria et.al.2003). Poultry litter is also a source of manure, about 40 adult birds can nearly form one ton manure a year (A C Garg et. al. 1971). Other wastes which can be used as manure are oil seed cakes, farm weeds, water hyacinth, forest litter, fruits and vegetable wastes and human wastes. These wastes are used in our country by the producers but in a very small quantity because use of bones, blood, meat, hair, horn of dead animals is considered irreligious. Due to age-long ignorance and prejudice people do not use the wastes of slaughterhouses. This waste is a headache for the municipalities and therefore, this need to be processed for agriculture. On one hand it will help in cleaning the city and on the other, reduce the cost of production by providing manure at a lower cost to the farmer.

One way to provide organic manure is by using green manures. The quantity in which the nutrients are available in this manure is the mentioned in the table below:

Table: 2 Availability of nutrients in Green Manure

Materials	N	P ₂ O	K ₂ O
Dhaincha	3.5	0.6	1.2
Sunnhemp	2.3	0.5	1.8
Wild Indigo plant	1.8	0.2	0.6
Wild Indigo Leaves	3.2	0.3	1.3
Indigo Refuge	1.8	0.4	0.3
Avari	2.0	0.7	1.0
Prickly Pear	0.3	1.2	1.1
Forest Leaves	1.2	0.6	0.4
Tea Prunings	2.4	0.5	1.3
Green Weeds	0.8	0.3	0.2
Sea Weeds	1.1	0.3	3.0
Fern Weeds	3.1	0.5	3.0
Red Gram Plant	2.8	0.5	2.0

Source: Arakeri and Others, op.cit., p.99 also see Mamoria, C.B. and Badri Bishal Tripathi, *Agriculture Problems in India*, p.215,2003

The above table shows the availability of nutrients in green manure, but it has some lacunas. Firstly, it is more effective on land having assured irrigation facility. Secondly, it is uneconomical in nature. In many cases, the subsequent crops have to be postponed nearly for two to three years. It needs no emphasis that application of chemical fertilisers gives instant results:

VII. Conclusion

However, in the long run, the productivity of land goes on declining on one hand and on the other, the nutritious value of the food grains also goes on falling. Therefore, it needs to be substituted by a factor which will give equal returns and its cost should be lower in order to maximise revenue for the farmer. Here the problem arises, with the substitution of chemicals the production may come down. It can discourage the farmers in the use of organic fertilisers and pesticides. The other thing is that the farmers may not be willing to use animal and human wastes. Another problem lies in the use of urban wastes. The municipalities are not using technology to convert the wastes

into manure. The city refuse is dumped in some place in the same city and it pollutes the soil, water, and air. This problem can be easily sorted out by converting it into manure which is highly nutritious for the soil and a burden for the city. The animal wastes from slaughterhouses are not being used for manure. Here the Government can support by encouraging plants which can convert animal wastes into manure. This is only a small part of the problem. Many other problems can pose challenges for sustainable agriculture. Distributing new input (organic manure and pesticides) will be a problem because the cost of entry of new suppliers will include cost of adaptation since the farmers are used to the use of chemicals. At first, they will be hesitant to use these for production. Here again, the Government will have to support the producers for a certain period until the latter start trusting the organic matter. The second cost will be of providing information. Since the input is new therefore, the distributor has to provide proper information about the product and its use. The information provided should be in the local language either by mass media or non-profit organisations. This imparting of information also incurs additional cost of production therefore here again, the support of the Government is required at least for some years. One more cost for the distributors is opposition by the distributors, distributing traditional input; here again the Government's support is required R.N. Soni (2011). The same problem is faced by the developed economies also, where production of food grains is more than the demand. There, it is not a problem because people are aware about the need of organic food therefore, they demand it, in spite of increased prices. There the cost of production is also less as it does not involve cost of adaptation and cost of providing information. In an underdeveloped economy, the production of food grains is lesser as compared to the demand. Therefore, the poor farmers are not in a position to wait for two to three years. So, they need help from the Government for at least two to three years. Here, the problem will crop up both on the supply and demand side. The supplier has to face the challenges of higher cost of production (due to the reasons mentioned above) and on the demand side, the farmers will not be willing to purchase this new input because they are not in the position to have complete faith in them. In this position things cannot be left on the forces of market because of the uncoordinated decisions which will imbalance the demand and supply. Moreover, the market approach does not ensure complete harmony between the social welfare and private interest. Therefore, it is in broader national interest that the Government should support both the demand and the supply sides for some years.

REFERENCES

- Howard, *An Agricultural Testament*, P.210. also see Mamoria, C.B. and Badri Bishal Tripathi (2003) *Agriculture Problems in India*, p.201
- AC Garg, M.A. Indanani and T.P. Abraham, Organic manure, I.C.A.R., Technical Bulletin, 1971 also see Mamoria, C.B. and Badri Bishal Tripathi, *Agriculture Problems in India*, p.212, 2003
- Agrawal A., Pandey RS, Sharma B (2010) Water pollution with special reference to pesticide contamination in India. *J Water Res Prot* 2(5):432-448
- Amit Kumar, Damodar Saur and Bimal Kishore Sahoo, National Food Security act, 2013: Problems and Prospects, *Engage/Social Action* 3, (6):265-275, Dec, 2018
- Chandrasekhar, C. P. (2012) 'India's triumph in rice', *The Hindu*, 23 December.
- croppnutrition.com/resource-library/understanding-fertilizer-and-its-essential-role-in-high-yielding-crops, 2018
- D. Narsimha Reddy and Srijeet Mishra, 2010, edited book on *Agrarian Crisis in India*
- Daji, J.A., Manures and Manuring, *Farm Bulletin*, No. 7, I.C.R. New Delhi, 1955 and Arakeri, H.R. and others, *Soil Management in India*, p.82, 1962
- Das A, Munda GC, Patel DP (2009) Technological options for improving nutrient and water use efficiency. ICAR Research Complex for NEH Region, Umiam-793103, Meghalaya. Retrieved from http://www.kiran.nic.in/pdf/publications/Water_Use_Efficiency.pdf Accessed 20 Dec 2014.
- Donald L. Plucknett and Donald L. Winkelmann, *Technology for Sustainable Agriculture*, *Scientific American*, Vol. 273, No. 3 (September 1995), p.185
- FAO, *Fertiliser Use by Crop* (2006), *Fertiliser and Plant Nutrition Bulletin*, pp.3
- financialexpress.com/budget/india-economic-survey-2018-for-farmers-agriculture-gdp-msp/1034266/, by Sushruth Sunder, updated, Jan 29, 2018, 3:05 PM
- Food and Security analysis, India (2019), Government of India, p.80
- Harrison P, Bruinsma J, de Haen H, Alexandratos N, Schmidhuber (2002). *World agriculture: towards 2015/2030*. Retrieved from <http://www.fao.org/docrep/004/y3557e/y3557e11.htm>. Accessed 11 Jan 2015
- Hayo MG, Werf VD (1996) Assessing the impact of pesticides on the environment. *Agric Ecosyst Environ* 60:81-96 https://www.researchgate.net/publication/286042190_Effects_of_Pesticides_on_Environment
- Hegde NG (2000) Sustainable agriculture for food security. *Indian Farming* 49(12) also see Suman Patra, Pulak Mishra, S. C. Mahapatra, S. K. Mithun, (2016), *Modelling impacts of chemical fertilizer on agricultural production: a case study on Hooghly district, West Bengal, India*, p.180
- Jaga PK, Patel Y (2012) An overview of fertilizers consumption in India: determinants and outlook for 2020-a review. *Inter J Sci Eng Technol* 1(6):285-291
- John P. Reganold, Robert I. Papendick and James F. Parr, *Sustainable Agriculture*, *Scientific American*, Vol. 262, No. 6, p.112 (JUNE 1990)
- John P. Reganold, Robert I. Papendick and James F. Parr, *Sustainable Agriculture*, *Scientific American*, Vol. 262, No. 6, p.112 (JUNE 1990)
- K. Samand Chandra, V. Suresh Babu, Pradip Nath, 2013 book on *Agrarian Crisis in India: The Way Out*
- Kaushik Majumdar, Adrian M. Johnston, Sudarshan Dutt, T. Satyanarayana and Terry L. Roberts (2013), "Fertiliser Best Management Practices: Concept, Global Perspectives and Application", *Indian J Fert.*, Vol 9 (4), p.1

22. Kumar S, Singh P (2010) Inclusive agricultural growth: district-wise agricultural productivity analysis in Punjab. In: Proceedings of National Workshop on Inclusive Agricultural Growth: Regional Perspective, pp 21–51
23. Lakhwinder Singh, Kesar Singh and Rakesh Sharma, 2016, book on Agrarian Distress and Farmers Suicides in North India" adoption of modern technology.
24. Mamoria, C.B. and Badri Bishal Tripathi, 2003, Agriculture Problems in India, p.205-2011.
25. Maredia M, Pingali P (2001) Environmental impacts of productivity-enhancing crop research: a critical review. CGIAR Technical Advisory Committee Secretariat, FAO, Rome.
26. Móznér, Z., Tabi, A., & Csutora, M. (2012). Modifying the yield factor based on more efficient use of fertilizer—The environmental impacts of intensive and extensive agricultural practices. *Ecological Indicators*, 16, 58-66.
27. P Dey and B.S Sekhon (January, 2016), Nitrogen Fertility Status of the Indian Soils vis-a-vis the World Soils, Indian Journal of Fertilisers, Vol. 12 (4), p.36
28. Patra, S., Mishra, P., Mahapatra, S. C., & Mithun, S. K. (2016). Modelling impacts of chemical fertilizer on agricultural production: a case study on Hooghly district, West Bengal, India. *Modeling Earth Systems and Environment*, 2(4), 1-11.
29. Planning Commission of India (2011) Crop husbandry, agricultural inputs, demand and supply projections and agricultural statistics for the Twelfth Five Year Plan (2012–2017). Retrieved from http://planningcommission.nic.in/aboutus/committee/wrkgrp12/agri/crop_husbandry.pdf.
30. Pritchard, B., Rammohan, A., Sekher, M., Parasuraman, B. and Chaitani, C. (2013) Feeding India – Livelihoods, Entitlements and Capabilities, London, and New York: Routledge, Earthscan
31. R. S. Deshpande and Saroj Arora, 2010, edited book on Agrarian Crisis and Farmers Suicide,
32. R.N. Soni (2011), *Leading Issues in Agricultural Economics* p.137
33. Raman, R., & Khan, K. A. (2017). Crisis of Agriculture in Uttar Pradesh: Investigating Acuteness & Antecedents. *Amity Journal of Agribusiness*, 2(1), 13-27.
34. Randhawa, M. S. (1958). Agriculture and animal husbandry in India. *Agriculture and animal husbandry in India*.
35. Satynarayana T, Bhavdish Narain Johri, Anil Prakash (2012), *Microorganisms in Sustainable Agriculture & Biotechnology*, p.87
36. Sharma DR, Thapa RB, Manandhar HK, Shrestha SM, Pradhan BB (2012) Use of pesticides in Nepal and impacts on human health and environment. *J Agric Environ* 13:67–72
37. Shweta Saini and Marta Kozicka (Sept. 2014) Working Paper on Evolution and Critique of buffer stock policy, Indian Council of Research for International Economic Relations
38. SK Goyal, Prabha JP, Rai, R Singh, (2016), Indian Agriculture and Farmers Problems and Reforms, Indian Agriculture and Farmers, p.1
39. Suman Patra, Pulak Mishra, S. C. Mahapatra, S. K. Mithun, (2016), Modelling impacts of chemical fertilizer on agricultural production: a case study on Hooghly district, West Bengal, India, p.180
40. Suman Patra, Pulak Mishra, S. K. Mithun, Modelling impacts of chemical fertilizer on agricultural production: a case study on Hooghly district, West Bengal, India, *Model Earth Syst Environ*, (2016)
41. Thomas Robert Malthus, ed. EA Wrigley and David Souden (1986) *Population: The First Essay* p.53, and Amartya Sen (2010), *Development as Freedom*, p.205.
42. UNEP (United Nations Environment Program) (2001) State of the environment, India 2001. Retrieved from http://www.envfor.nic.in/sites/default/files/soer/2001/ind_land.pdf. Accessed 26 Jan 2015.
43. Velthof G, Barot S, Bloem J, Butterbach-Bahl K, Vries W, Kros H (2011) Nitrogen as a threat to European soil quality. *Eur Nitrogen Assess Sour Eff Policy Perspect Chap* 21:495–509

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A Solution to Agrarian Crisis in India

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Abstract- Problem of agricultural distress in India started with the mismatch of demand and supply of food grains. India adopted the process of industrial agriculture to deal with the problem of inadequate supply, which implies application of goods produced by industries for increasing production in agriculture. It causes the problem of declining productivity and income of farmers, deteriorating environmental quality, reduced profitability, and threat to the health of humans, animals, and nature in India. The paper aims at suggesting the causes of deteriorating term of trade between agriculture and industry and ways to improve it along with suggestion on alternative inputs like- organic fertilisers and pesticides which will not only make agriculture a profitable venture but also have higher nutritive value with sustainability.

2.Introduction-

Food is one of the fundamental needs of humanity. That is why it has been felt by the Indian Constitution that every citizen should be provided with right to food, work, and education. It should however be pointed out that even after more than 70 years of independence we are not in a position to sort out the problem of food or agriculture (Amit Kumar, Damodar Saur and Bimal Kishore Sahoo, 2018). We have travelled from the position of absolute shortage of food grains to self-sufficiency in food production. Post-independence, India had to import almost three million tonnes of wheat for its domestic consumption (Majumdar, N.A 2007). Further, we had to depend on America's benevolence, which supplied wheat under the PL 480 programme. Time changed as India adopted the Green Revolution in 1966 attaining self-sufficiency in food grains in 1970 (Koichi Fujita, 2010) and emerged as an exporter of food-grains (De Janvry, A. and Subbarao, K., 1986). One can say that it was a transformation of Indian agriculture from a chronically shortage sector to a surplus one. Now Indian agriculture is facing more complex set of problems. India is home of the largest number of underfed and undernourished. It is a paradox that on one hand our granaries are full of grains and therefore we are exporting food grains and on the other hand large numbers of people are still suffering from the problem of hunger (theguardian.com/world/2010). It seems that existence of sizeable export is an effective demand surplus rather than a genuine surplus (Majumdar, N.A 2007). It is really tragic that the economy is not able to produce enough to fill the belly of underfed. It is not only the case of Indian economy but also of many countries. The world population is in a race with food grains and is on the winning side. It appears that theory of Malthus has come true. He anticipated that food production is losing race to population because population multiplies geometrically while the food grains increase arithmetically. He was of the opinion that "the period when the number of men surpass their means of subsistence the necessary result must be either a continual diminution of happiness and population, a movement truly retrograde, or at least a kind of oscillation between good and evil?" (Thomas Robert Malthus 1798). Now the

theory given by Malthus has shown its practical importance because even though the food production is increasing day by day, it is still lagging behind in meeting the requirements of the increasing population.

With the initiation of development, the industrial sector depends upon agricultural sector for its requirement of not only land but also capital and labour. However, later on industrial sectors dependence goes on declining because it invests its capital on development of its own projects (Soni. R.N, 2011). As the industrial sector develops, its dependence on agriculture goes on declining for its raw material. Requirement in terms of labourers also declines as the techniques adopted by the industrial sector is highly capital intensive (Dimitri et al., 2005). On the contrary the dependence of agricultural sector on industrial sector increases for modern inputs such as fertilisers, insecticides etc. The agriculture which had a self-dependent village economy gradually converts into industrial agriculture, whereas agriculture depends on industrial inputs for its requirements. Therefore, the terms of trade is on a decline with industry. The paper is an attempt to look at the terms of trade between agriculture and industry in Indian economy; causes of deterioration of terms of trade and the problems faced by agriculture due to the same along with the suggestions for sorting out the same.

3.Objectives:

1. To study the terms of trade between agriculture and industry and the causes of deterioration .
2. Exploring Revenue and Cost condition of the farmers leading to deterioration in terms of trade between agriculture and industry.
3. To explore ways to sort out the deteriorating terms of trade.

4.Review of literature

India is an agricultural country because still more than sixty percent of the population depends upon agriculture for its livelihood. Though its contribution in GVA is declining it stood at 15.2 percent in 2017-18 but its importance cannot be under emphasised. Thematic review of literature to cover the term of trade between agriculture and industry is conducted to prepare a sound conceptual framework as following-

The book entitled ("Agrarian Crisis and Farmers Suicide d. R. S. Deshpande and Saroj Arora 2010) is an edited book focusing on the reasons of growing agrarian crisis and incidence of farmers' suicides in specific regions of India. The chapters are based on research and analysis conducted by academics and administrators in different parts of the country. The book entitled "Agrarian Crisis In India" (D. Narsimha Reddy and Srijeet Mishra,2010) deals with the causes behind agricultural distress in India and suggests various ways to sort out the problems that are being faced by the Indian farmers. It focuses on the macro and micro level of issues associated with agrarian distress. It analyses structural, institutional and policy changes for Indian agriculture.

The book entitled "Agrarian Crisis in India: The Way Out", (K. Samand Chandra, V. Suresh Babu, Pradip Nath, 2013) deals with the agricultural distress in India and suggest various solutions to the problem. It shows that lack of capital is the cause behind backward agriculture of Indian economy. It deals with

various factors such as inadequate expenditure on irrigation, dearth of cheap agricultural credit, use of modern technology, rate of interest and source of loan. The book entitled "Agrarian Crisis in India: The Case of Bihar" (F. Tomasso Junnuzi, 2014) focuses on the crisis of agriculture in Bihar. The book analyses various loopholes in implementation of land reforms in the State of Bihar as the cause of backwardness of Bihar.

The paper entitled "A Critique Inclusive Growth: Problems of Modernisation of Agriculture" (Sumya Chakroborti, 2014) deals with problems of intensive cultivation. The book entitled "Agrarian Distress and Farmers Suicides in North India" (Lakhwinder Singh, Kesar Singh and Rakesh Sharma, 2016) deals with agrarian distress and farmers suicides in India, The main focus of the book is on the rural stress in the State of Punjab. It deals with impact of technology i.e. rural development on rural suicides in Punjab. The paper entitled "Crisis of Agriculture in Uttar Pradesh: Investigating Acuteness and Antecedents", (Rakesh Raman and Khursheed Ahmad Khan, 2017) is a comparative analysis of crisis index of Agriculture in Uttar Pradesh and other States of India. The factors taken for the purpose are profitability, rural indebtedness etc.

There are many studies made on Indian agriculture that focuses on various causes of declining income of the farmers but the role of inputs in the cost structure have not gained much importance therefore more and more studies should be undertaken to study the optimal input structure for the farmer.

Research Gap- Above review of literature suggests that term of trade between agriculture and industry is really very significant for the agriculture to grow but to the best of researchers knowledge no study is found suggesting the causes of deteriorating terms of trade between agriculture and industry along with ways to improve it using alternative input methods of agriculture for growth and sustainability. Since there is a difference between the optimal use of inputs and actual utilisation therefore the terms of trade are found to be against the farmer. With this research gap this paper is an attempt to study the causes behind deteriorating terms of trade for the agriculturists for sustainability.

Methodology: The paper is based on secondary source of information. The data is collected from various economic surveys, reports of CACP, reports of Agricultural Statistics at Glance. The data so collected is presented in form of tables and diagram. Various statistical tools like average and percentage and regression are used for analysis of the data collected.

Present paper specifically looks at the terms of trade between agriculture and industry. It analyses the factors behind unfavourable terms of trade for agriculture. It is an attempt to suggest measures to bring about a favourable term of trade between agriculture and industry.

The paper is divided into three sections while analysis, first one deals with the terms of trade between agriculture and industry in India. Second section discusses the cost and revenue (selected crops) for the farmers and the third section examines the causes of deteriorating terms of trade for the farmers and ways to deal with the same using regression.

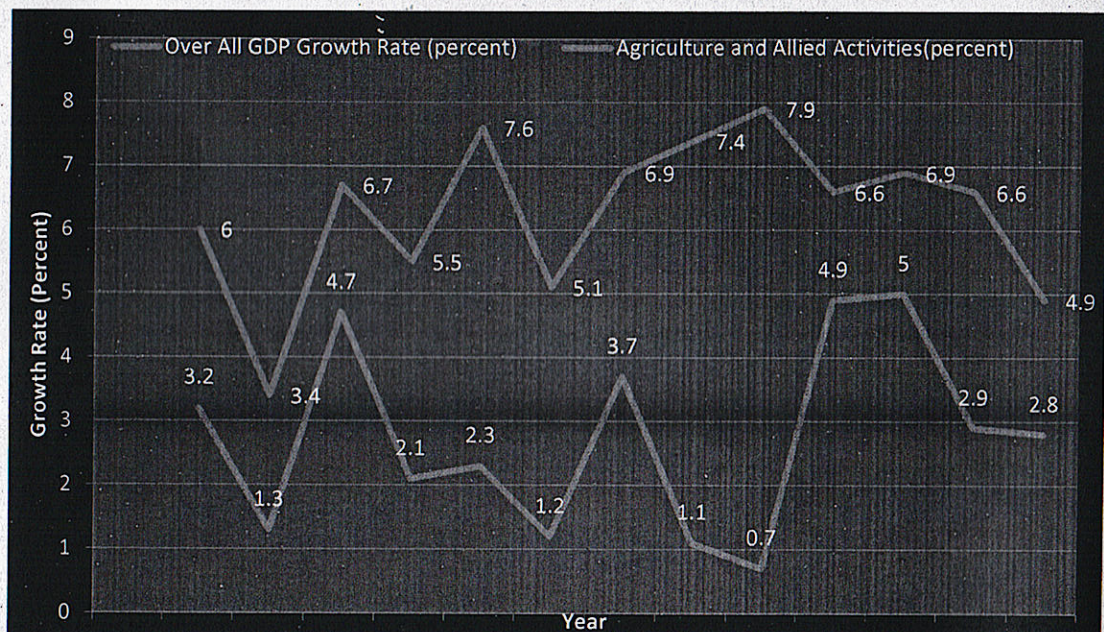
Analysis and Discussion part 1: Terms of Trade between Agriculture and Industry

Comparison of Average Annual Growth Rate of GDP and Agriculture and Allied Activities and Index of Terms of Trade between Agriculture and Non-Agricultural Sector is made to explore the causes of

deterioration.

If one looks at the history of economic development of various developed nations, the development of secondary and tertiary sectors was preceded by the development of agriculture. England depended on agriculture for its development in early stages. In France, Belgium, Germany, and Sweden the take-off depended upon agricultural productivity R.N. Soni (2011). In fact, many of the developed countries depended upon agriculture for their development. It is the source which has led to development of other sectors of the economy. Industrial sector had to depend upon agriculture for its requirement of raw material, capital, labour, and land. Therefore, the development of agriculture made the gross domestic product rise initially but later on the share of agriculture declined due to the development of industrial sector.

Chart 1.1 Comparison of Average Annual Growth Rate of GDP and Agriculture and Allied Activities



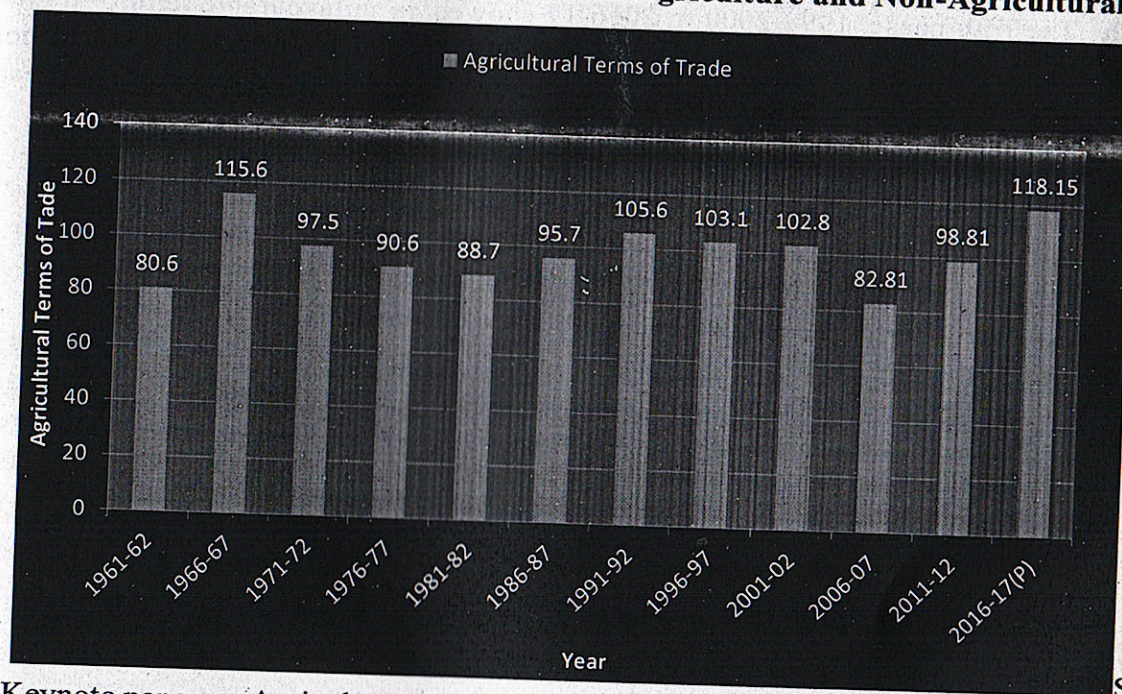
Source: Economic Survey, Government of India, Ministry of Finance, 2006-07, p.159, 2014-15.p.4,2017-18,p.3 and 2019-20,p.17

Note: Growth rate before 2001 is based on 1993-94 policies and from 2000-01 it is based on series at 1999-2000 prices.

Chart 1.1 deals with the comparative analysis of growth rate of all the sectors and Indian agriculture. There is fluctuation in the average annual growth rate of Indian agriculture. On one hand in the year 2003-04 the growth rate is as high as 10 percent and on the other it is as low as -7.2 percent in 2002-03. Growth rate of GDP is always more than Indian agriculture except for 2003-04. One of the reasons of continuously lower growth rate of Indian Agriculture (except for 2003-04) can be vagaries of climate or it can also be due to the lower allocation of resources in favour of agriculture¹. As the economy develops more resources are allocated in favour of industry rather than agriculture leading to development of industrial sector. The position of agriculture can be improved by allocation of more resources, but it is neglected at the cost of

development of the industrial sectors. One of the reasons for lower allocation of resources can be the lower expansion of market demand of agricultural commodities which could satisfy the wider flow of resources to agricultural sector. This approach makes a shift in focus from supply side to demand side, (Amartya Sen 2010). The policies of agriculture, especially pricing is more tilted towards consumers as compared to producers.

Chart 1.2 Index of Terms of Trade between Agriculture and Non-Agricultural Sector



Source: Keynote paper on Agriculture, Structural Reforms and Agriculture: Issues and Policies, S. MahendraDev, Chairman, CACP, Soni, R.N., Leading issues in Agricultural Economics, p188. Economic Survey, Ministry of Finance, Government of India, 2014-15, p.19, Directorate of Economics and Statistics, Ministry of Agriculture

It needs no emphasis that there is rise in food production all over the world due to which there is fall in price of food grains in real terms². This states that there is a decline in economic incentive to produce food grains even in developed countries of the world. In order to understand the level of living of people associated with agriculture one can use terms of trade (TOT). Chart 1.2 shows the terms of trade between agriculture and industry. The TOT can be divided into five phases. The first phase which starts from 1961-62 to 1963-64 is unfavourable to agriculture. There were many reasons for the same. Firstly, after successful completion of the first five year plan, the prices of agricultural commodities went down. Secondly, the assistance under PL 480 kept the prices under regulation. The second phase which started from 1964-65 to 1973-74 was favourable to agriculture. Many factors can be attributed for the same-the assistance under PL 480 came to an end which raised the price of the food grains and in 1965, Agriculture Prices Commission came into being which raised prices of many crops by fixing MSP. Phase III, 1974-75 to 1985-86 led to an unfavourable

term of trade. A study by Kahlon and Tyagi showed that the main reason for the change in terms of trade was rise in price of capital which was being purchased by the farmers for the sake of capital formation, (Kahlon, A S and D S Tyagi 1980). In the fourth phase between 1986-87 to 1998-99 a favourable terms of trade was seen because there was a sharp rise in MSP after 1989. Though there was rise in price of capital inputs like fertilisers, insecticides, and pesticides still the prices of cotton, cereals, pulses, meat, sugarcane made the terms of trade favourable. The fifth phase, 1999-2000 to 2016-17 showed an unfavourable term of trade in the initial phase. During this phase there was a rise in prices of both agricultural and non-agricultural sectors, comparatively the price of non-agricultural sector rose with a greater speed. The rise in prices of capital inputs like fertilisers and insecticides were higher than before, the reason attributed to it can be an extension of liberal indirect institutional credit to the farmers which made them purchase the fixed and variable capital inputs and the terms of trade was against agriculture till 2011-12. After 2012 the terms of trade was in favour of agriculture because the MSP was revised many times after 2013 (pib.gov.in 2018) and the consumption of fertilisers, insecticides and pesticides declined. TOT being favourable for agriculture shows that the standard of living is in a better position for the farms in Indian agriculture. Now the question arises as to why the farmers are not interested in continuing with their profession (downtoearth.org.in, 2018) if they are earning profits. Therefore, there is a need to study the cost and revenue condition of the farmers in India. The second section of the paper is an attempt to study the revenue and cost conditions of the Indian farmers.

Thus, Comparison of Average Annual Growth Rate of GDP and Agriculture and Allied Activities and Index of Terms of Trade between Agriculture and Non-Agricultural Sector

8. Analysis and discussion part II: Exploring Revenue and Cost condition of the farmers leading to deterioration in terms of trade between agriculture and industry.

In order to understand the revenue position of the firms engaged in agriculture one has to look at the position of prices of the crops sown. Table 1.1 deals with the position of MSP fixed by the Government in 2018-19. The remunerative prices for the farmers were ensured in the Union Budget 2018-19 which had a provision that the MSP should be at least 50% more than the cost of production (economictimes.indiatimes.com, feb 9 2018). The table deals with 5 important crops of India, for each one the price offered by the Government was between 150% to 212% in case of A2+FL while in case of C2 it was between 112 to 137 percent. This means that the prices offered in the regulated market were above the cost of production and theoretically the firm is earning supernormal profits. However, the dissatisfaction of farmers indicates that there are other serious reasons which still remain undiagnosed (Eve Crowley, 2013). Farmers are continuously leaving agriculture and moving towards cities for an alternative source of livelihood (Chand, R., Srivastava, S. K. & Singh, J. 2017). Therefore, there is a need to look at their cost of production more minutely which, in industrial agriculture, depends mainly upon fertilisers, insecticides and HYV seeds.

Table 1.1 : MSP as % Cost of Production

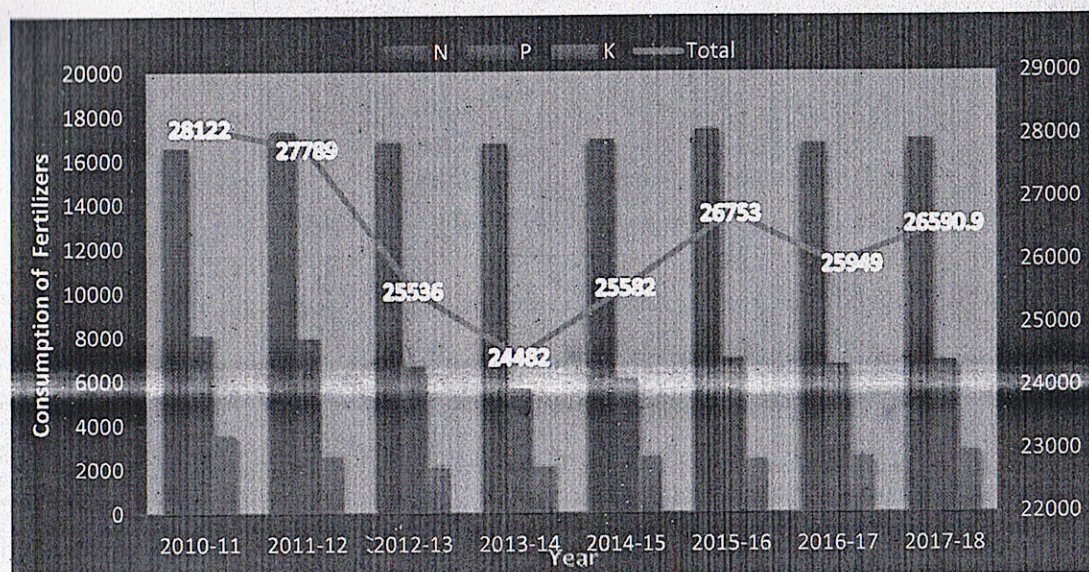
Crops	All India Weighted Average Cost of Production(Rs./Quintal)		MSP for 2018-19 for Kharif and 2019-20 for Rabi(Rs/Quintal)	MSP to costsratio(%)	
	A2+ FL	C2		A2+FL	C2
Paddy	1,166	1560	1750	150	112
Wheat	866	1339	1840	212	137
Arhar	3432	4981	5675	165	114
Moong	4650	6161	6975	150	113
Urad	3438	4989	5600	163	112

Note: A2 = Cost farmer actually pays, viz. input costs for seeds, fertilisers, pesticides, labour, interest on loan etc., and hiring cost of machinery and leased-in land; A2+FL = Imputed cost of family labour added to A2; C2 = Comprehensive cost, which includes A2+FL, imputed rent of owned land and imputed interest on owned capital.

Source: Price Policy for Kharif Crops 2018–19 Marketing Season & Price Policy for Rabi Crops 2019–20 Marketing Season, Commission for Agricultural Costs and Prices (CACP), Government of India, and Ministry of Agriculture and Farmers' Welfare, Government of India, for Ministry of Statistics and Programme Implementation, Government of India. Also see Annual Report, NABARD, P.10, 2018-19

It should be noted that with the cultivation of a crop, nutrients present in the soil get exhausted. Therefore, in order to keep the productivity of the land intact, farmers apply doses of fertilisers. Chart 1.4 shows the use of chemical fertilisers in India. No doubt, fertilisers increase nutrients in the soil but their excessive use is dangerous for the health of the soil. The total consumption of fertilisers in 2010-11 was 28,122 thousand tonnes which declined to 24,482 thousand tonnes in 2013-14. In 2014-15 it was 25,582 thousand tonnes which increased to 25,949 thousand tonnes in 2016-17. Fertilisers are the chemical inputs which when applied in desired quantity give good results but if used limitlessly lead to damage of soil profile forever. Application of capital on soil more than what is required leads to deterioration of nutrient content of the soil and limits the process from becoming sustainable. It should be regarded as a banditry because the future generation is be fooled by the present generation and future generation is not able to defend themselves (Howard, *An Agricultural Testament* 2003).

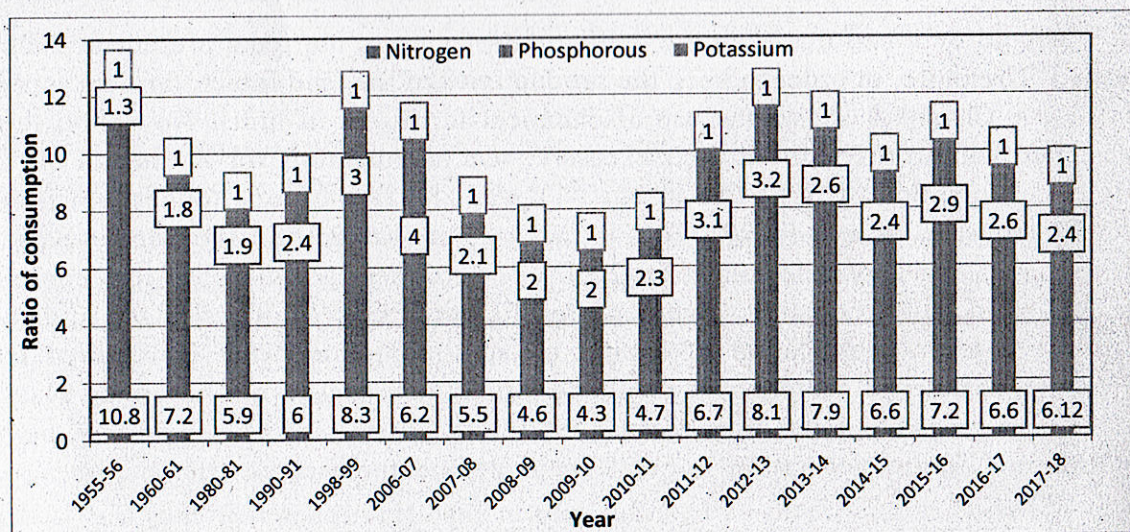
Chart 1.3 Consumption of Fertilisers in India (000 tonnes)



Source: Fertiliser Association of India, Also See CACP report, p. 63, Agricultural Statistics at Glance, p.312,2018

Mere looking at the consumption of fertilisers cannot give the correct picture. It cannot be denied that chemical composition of the fertilisers is also important for the soil's health.

Chart 1.4 Ratio of Consumption of Fertilizers



Source: Economic Survey Government of India, Ministry of Finance, 1998-99, 2006-07, Department of Fertilisers, Ministry of chemical and Fertilisers, 2015

An important consideration is about the ratio at which the three fertilizers, namely N+P+K are to be applied. Mostly it differs according to the type of soil. The ideal ratio for Indian soil is 4:2:1, i.e. if 4 kg of nitrogenous fertilizers is applied, 2 kg phosphorous and 1 kg of potassium should be applied to get good results. Indian farmers have been using fertilizers in a different ratio. Chart 1.5 shows the ratio of application of fertilisers. It is ironical that the above-mentioned ratio was never applied by the farmers in India since the

inception of the second five-year plan. In 1955-56 it was 10.8: 1.3:1, in 1980-81 the position was a bit better as the ratio of the use of the fertilizers was 5.9: 1.9:1. In 2008-09, it was used 4.6:2:1 but again the ratio it increased to 6.7:3.1:1 in 2011-12. In 2012-13 the ratio was as high as 8.1:3.1:1 but happily it declined to 6.6:2.6:1 in 2016-17. The chemical composition of fertilisers is different than what is desired for making the soil healthier. It was felt by the steering committee of planning commission that since the nitrogenous fertilizers were subsidized more than potassic and phosphatic fertilizers, they were applied in comparatively higher amounts (Economic Survey 2007-08). Though the government has changed its fertilizer policy from mere subsidy to nutrient-based subsidy (NBS), it did not lead to improvement in balanced use of fertilisers. The new policy failed to improve the price parity between urea and other fertilizers. As shown above, it is therefore essential to ensure balanced use of all the three nutrients, namely NPK. The NBS system even while envisaging fixed subsidy linked to the nutrient content of different fertilizers also simultaneously decontrols the farm gate prices of fertilizers other than urea (Business Standard, Vol. IV, NO. 271, 22 April, 2010). Further, in order to encourage the balanced use of fertilizers, a new concept of customized fertilizers which are both soil and crop specific, has been used by the Government. Organic fertilizers namely city-based compost and vermin compost and bio fertilizers namely rhizobium, azotobacter, azospirillum and phosphate solubilising bacteria have been recognized and incorporated in the Fertiliser Control Order (FCO) 1985 (Satynarayana T, Bhavdish Narain Johri, Anil Prakash 2012).

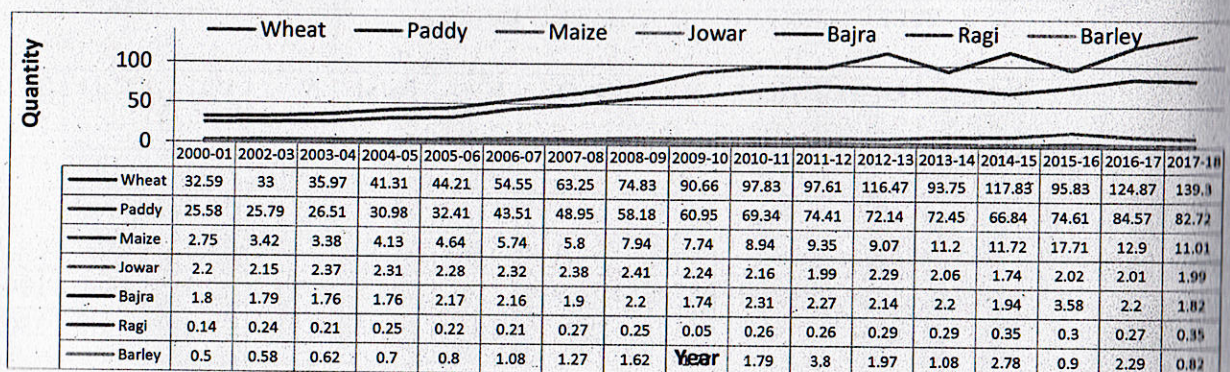
Table: 1.2 Fertiliser Consumption per Hectare of Agricultural Land in selected Countries

	2014				2015				2016			
	N	P ₂ O ₅	K ₂ O	Total	N	P ₂ O ₅	K ₂ O	Total	N	P ₂ O ₅	K ₂ O	TOTAL
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
USA	29.1	10.0	10.9	50.0	30.0	10.6	11.8	52.4	29.0	10.4	11.8	51.3
Canada	39.5	14.5	6.1	60.1	40.5	16.4	6.0	62.8	38.7	15.5	6.7	60.9
France	76.3	14.2	15.9	106.4	77.0	14.9	12.9	104.8	78	12.5	13.6	104.1
Bangladesh	145.2	66.7	47.8	259.7	137.2	70.5	49.7	257.4	131.5	68.2	51.0	250.7
China, Main	48.9	29.6	15.9	94.4	52.5	22.9	18.9	94.4	49.4	22.5	18.7	90.5
India	94.4	34.0	14.1	142.4	96.7	38.8	13.4	148.0	93.1	37.3	14.0	144.4
	(85.4)	(30.7)	(12.8)	(129.0)	(87.6)	(35.2)	(12.1)	(134.9)	(84.4)	(33.8)	(12.6)	(130.8)
Nepal	25.7	11.4	0.5	37.6	25.9	7.2	0.7	33.9	3.6	0.2	-	3.8
Pakistan	91.4	26.9	0.9	119.3	73.8	27.8	0.6	102.2	101.2	34.4	1.1	136.8
Sri Lanka	72.7	26.9	33.2	132.8	88.4	25.3	38.6	152.3	55.0	11.5	18.8	85.2
K	60.8	11.6	15.8	88.2	59.9	11.4	15.8	87.1	60.8	11.3	16.3	88.4
Australia	3.5	2.3	0.6	6.3	3.7	2.6	0.7	7.0	4.1	2.4	0.7	7.2

Source: Agricultural Statistics at a Glance 2017 and 2018

Table 1.2 deals with the comparative analysis of consumption of fertilisers all over the world. The fertiliser consumption was 60.1 Kg/hect in Canada in 2014 which increased to 60.9 in 2016. In France it was 106.4 Kg/hect which declined to 104.1 Kg/hect in 2016-17. In UK it was 88.2 Kg/hect which increased to 88.4 Kg/hect in 2015-16. The whole world taken together used 37.1 kg/hect fertiliser which increased to 38.1 Kg. In 2014-15 India consumed 142.4 Kg/ hect which increased to 144.4 in 2016-17. The use of chemical fertiliser on a bigger scale is a sign of incurring extra cost which not only reduces the marketable surplus for the farmers but also degrades the soil profile of the country on one hand and on the other it reduces the nutritious power of food. Since the world is now a global village therefore the goods produced either on farm or nonfarm will not be in the position to compete with the product which will be relatively cheaply produced elsewhere in world (because it has incurred less cost on fertilisers). Now, it is very clear that not only proportion of the chemical fertilisers applied is wrong but also the usage in total is more than three times the world's average. It needs no emphasis that the demand elasticity of food and non-food items is less than one in agriculture because they are the necessities of life (R.N. Soni 2011). Therefore, the prices of these goods cannot be left at the mercy of market forces, rather they are to be regulated by the Government. That means that on one hand the prices are predetermined and on the other, more chemical fertilisers are used which increases the cost of production and ultimately diminishes the profits. This is the position of consumption of one of the inputs. The position of other inputs is the same. One of the important inputs in production is HYV seeds. These seeds are produced and processed in Laboratories that certify assured production after its use.

Chart 1.5 Crop wise Distribution of Certified/Quality Seeds (lakh Q)



Source: Agricultural Statistics at Glance, p.329, 2018

One of the methods of improving the agricultural technique is improvement of plants in terms of quality and quantity. The methods of plant improvement involve extra cost and constant care, whereas use of improved variety involves a surplus of slighter extra expense. These certified seeds are constantly passed through experiments which means assured extra production for the agriculturists at a slight expense. The increased production by these seeds encouraged the farmers to use these products in their fields. In 2001-02 the use of certified seeds of cereals was 65.6 lakh q which more than doubled to 165.16 lakh q within a decade. Further in 2015-16, the use amounted to 194.95 lakh q which increased to 238 lakh q in 2017-18. In case of pulses, the position was much better. The use of certified seed was 4.69 lakh q which increased more than threefold within a decade. In 2015-16 it was 22.71 lakh q which increased to 23.54 lakh q in 2017-18.

No doubt, the HYV seeds lead to increased production but at the same time they need more fertilisers and insecticides (Arnold, 2009) as they are more prone to diseases and moreover the farmers cannot use the finished product as seed. They must depend upon Government, NGOs, and private sector for their seed requirements. Traditional crops could be used for creating seeds for future crops but now after using HYV seeds, each cropping season the farmer must purchase seeds for sowing which further escalates the cost of production.

Since the average size of land holding is less than 2 hectares in India therefore, for a farmer matters from where these seeds are purchased. As mentioned above it is supplied by the Government, Private sector, and NGOs. The Government provides it at a nominal price, but it is provided by the private sector at a higher price for getting more and more profit. Since the seeds are the private goods, therefore, the farmers can very easily be excluded from the market if they are not in the position to pay the prices. The smaller farmers must negotiate with the market forces for getting the crop within time. Chart 1.7 shows crop wise requirement and availability of seeds. The seed requirement for cereals is 215.58 lakh q whereas the availability of seeds was 230.74 lakh q which shows a rosy picture but in reality, the distribution by Government was 94.06 lakh q whereas the private sector provided 136.68 lakh q. In 2016-17, the availability increased in public sector to 128.58 lakh q and the share of private sector was 131.14 lakh q in the case of cereals. The share of public and private sector showed a decline in 2017-18. The share of public sector was 111.92 lakh q while private sector contributed 168.57 lakh q in the total seed production. The private sector is still dominant in the distribution of certified seeds. The buyers of the input must negotiate with the market supply to determine the price because they have to buy the seeds within a particular time period to raise the crops ready within time. Therefore, the negotiation done is against the farmer.

Table 1.3 Crop Wise Requirement and availability of Certified/ Quality Seeds(lakh quintals)

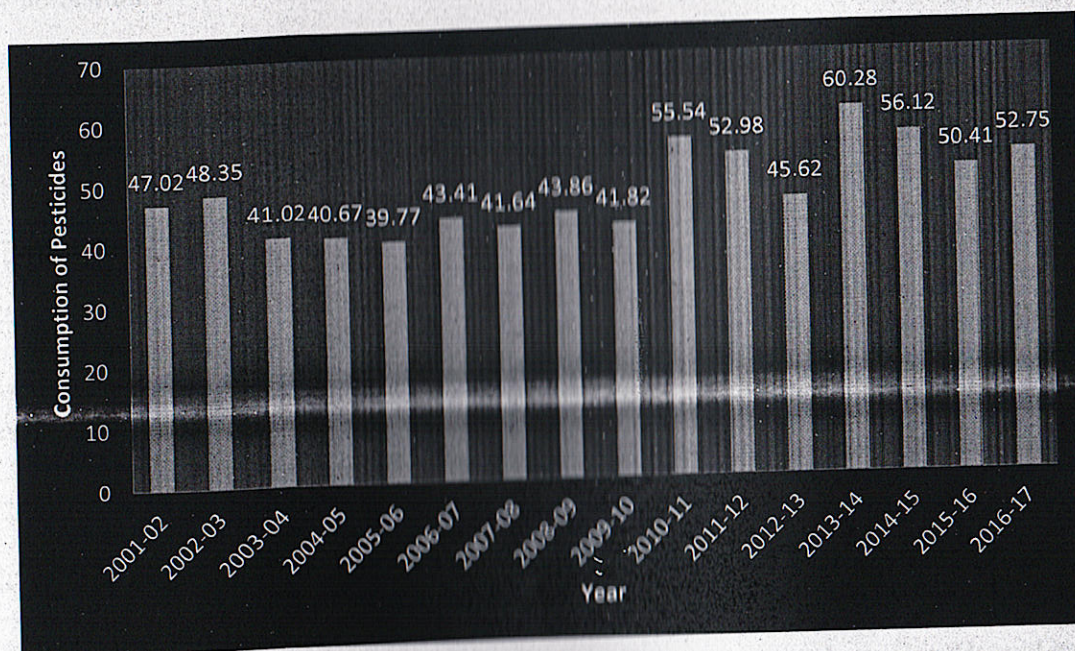
Crop	Req ui- rem ent	2014-15			Req ui- rem ent	2015-16			Req ui- rem ent	2016-17			Req ui- rem ent	2017-18		
		Availability				Availability				Availability				Availability		
		Pub lic	Priv ate	Tot al		Pub lic	Priv ate	Tot al		Pub lic	Priv ate	Tot al		Pub lic	Priv ate	Tot al
Whe at	112. .53	44. 78	72.0 7	116 .86	113 .46	51. 25	66. 73	117 .98	117 .55	61. 67	74. 91	136 .58	121 .26	55. 40	94. 37	149 .77
Padd y	84. 8	46. 46	46.4 612	92. 92	82. 86	47. 96	47. 14	95. 1	87. 74	63. 14	37. 33	100 .47	89. 50	52. 47	51. 60	104 .07
Ragi	0.3 1	0.2 5	0.11	0.3 6	0.3 2	0.4 7	0.0 7	0.5 3	0.3 4	0.4 3	0.1 3	0.5 6	0.3 0	0.3 5	0.1 3	0.4 7
Maize	2.2 3	0.6 1	2.26	2.8 7	2.2 5	0.6 9	2.4 8	3.1 7	2.4 4	0.5 8	2.3 7	2.9 5	2.3 0	1.0 7	2.4 1	3.4 8
Maize	10. 84	1.1 5	11.1	12. 25	10. 7	0.7 3	11. 96	12. 69	12. 47	1.6 7	11. 87	13. 54	14. 46	1.3 6	14. 32	15. 68
Maize	2.4 2	0.1 6	2.53	2.6 9	2.5 5	0.2 7	2.5 7	2.8 4	2.3 6	0.2 5	2.3 9	2.6 4	2.8 6	0.1 6	3.0 5	3.2 0

Jowar	2.42	0.62	2.13	2.75	2.95	0.77	2.39	3.16	2.82	0.80	2.09	2.89	3.34	0.99	2.53	3.52
Others	0.03	0.02	0.02	0.04	0.05	0.01	0.06	0.06	0.07	0.04	0.05	0.09	0.28	0.14	0.16	0.30
Total	215.58	94.06	136.68	230.74	215.15	102.14	133.39	235.53	225.79	128.58	131.14	259.72	234.31	111.92	168.57	280.49
Gram	16.11	12.36	3.36	15.72	18.14	7.3	7.56	14.86	17.65	9.95	6.05	16.00	17.16	14.57	4.69	19.27
Urad	2.68	2.00	1.3	3.31	2.62	1.36	1.36	2.71	2.67	1.79	1.1	2.90	2.74	2.70	1.04	3.74
Cowpea	0.36	0.2	0.15	0.35	0.26	0.14	0.15	0.29	0.19	0.14	0.09	0.23	0.27	0.15	0.13	0.28
Mung	2.79	1.72	1.58	3.31	2.87	1.63	1.63	3.23	2.68	1.90	1.37	3.27	2.41	1.79	1.36	3.14
Arhar	2.64	1.15	1.63	2.78	2.51	1.11	1.62	2.72	2.71	1.32	1.65	.97	3.31	1.59	2.22	3.81
Pea	1.96	0.5	1.06	1.57	2.12	0.59	1.24	1.83	2.67	1.41	1.50	2.91	2.39	0.82	1.54	2.36

Source: Agricultural Statics at Glance.p.327,2018

The HYV seeds need more amounts of pesticides and insecticides for plant protection. The use of pesticides is considered as an important part of cultivation nowadays. The consumption of pesticides in India was 47.02 thousand tonnes in 2001-02 which increased to 55.54 thousand tonnes within a decade. Further, it reached to the highest of 60.28 thousand tonnes in 2013-14 and declined to 52.75 in 2016-17. Widespread and indiscriminate use of toxic pesticides is causing ill effects on human (Blair A, Axelson O, Franklin C, et al,2016) and animal health (Kaphalia and Seth,1981). Besides polluting air (Hurley, et al.,1998), water(Werner,2002), and soil (Schreck,2008), it leads to increased cost of production. The pests are now becoming stronger and require more pesticides for plant protection. The cost of production of the farmers is on an increase but the demand of agricultural commodities are of inelastic nature due to which agricultural commodity prices do not increase in the same ratio.

Chart 1.6 Consumption of Pesticides (Technical Grade Material) 000 Tonnes



Source: Agricultural Statistics at a Glance, 2018, p. 310

The difference between revenue and cost of production is profit. A rational producer tries to minimise the cost of production so that he can maximise the profits. In order to maximise profits Indian farmers converted the traditional agriculture into industrial agriculture. Farm has now become the plant using inputs such as chemical fertilisers, insecticides and pesticides produced by the industrial sector. Industrial agriculture utilises expensive inputs produced by the industrial sector which not only damages the environment by using more and more fossil fuels and various chemicals which drives out the small producers and undermines the rural community (Leo Horrigan, Robert S. Lawrence and Polly Walker, 2019). No doubt the Indian agriculture appears efficient because the prices are above the cost of production. However, this is half of the picture because most of the inputs namely fertilisers, insecticides, machines etc. purchased by the small farmers are from the private sector or market where the farmer does not enjoy a favourable position. It needs no emphasis that if he waits for a better negotiation, it will take time so the quality of his production will be affected badly. Therefore, he purchases inputs from market at whatever price he gets and waits for the MSP of his finished product. One of the reasons for the deplorable position of the farmers is that most of the policies are more consumer-oriented rather than producer-oriented. Most of the farmers do not get the MSP due to the paucity of procurement infrastructure (Evaluation Study, Niti Ayog 2016). The wheat and rice are traded below MSP during the post-harvest period. Even a small rise in prices of farm products invites Government intervention through measures like stock holding limits, curbs on exports and emergency imports. Onion is the latest example. Hence, not only efficiency but also productivity is equally important for agriculture. Table 2.1 is a comparative analysis of the yield among various countries. Rice is one of the crops which forms a major part of food in India but in spite of the modernisation of cultivation, the world average is almost double and the Chinese production is almost three times of what is produced in India. Even the highest producing State, Punjab, is nowhere near the world average. None of the crops in the table is able to match either the world average or world's highest. This means we have somewhere gone wrong. On one hand, due to adoption of industrial agriculture, the cost of production has increased a lot and on the other, we are still not in the position to touch the world average.

Therefore, an introspection needs to be done to determine where the policy has gone wrong.

Table: 1.4 Yield comparisons for major Crops (kg/hectare)

Crop	World Average*	World Highest*	All India Average#	State Highest#
Rice (Paddy)	4636.6	6932.4 (China)	2400.2	3974.1 (PUN)
Maize	5640.1	10960.4 (USA)	2562.7	7010 (TN)
Pulses (Total)	731.2	5540.3 (Australia)	656.2	931 (Guj)
Tur	829.9	1612.3 (Kenya)	646.1	1124.8 (Guj)
Soybean	2755.6	3500.6 (USA)	738.4	831 (MP)
Groundnut	1590.1	4118.6 (USA)	1464.9	2574.3 (TN)

Note: *FAOSTAT for World Average and World Highest

Source: #DES, Department of Agriculture, Co-operation, and Farmers Welfare for All-India Average and State Highest. CACP Report, 2018, p. 65

9. Analysis Part III : To explore ways to sort out the deteriorating terms of trade

There is a need to know the importance of inputs namely quality seeds, fertilisers and insecticides towards not only the cost of production but also productivity of land. A multiple linear regression analysis was done in the study. For this analysis production of food grains was taken as dependent variable while quality seeds, fertilizers and pesticides as predictors. The data was taken for the period of 17 years (2001-02 to 2017-18) from various issues of Agricultural Statistics at Glance. The study deals with not only statistical significance but also the direction of the relationship. It was found that the independent variables were highly correlated with the dependent variable as R was 0.927 and R^2 was 0.859. 85 percent production of food grains were explained by these three predictors. The constant value in the model is 166.278. It means that if the predictors value is Zero then the food grains production will be 166.278 million tonnes. The independent variable quality seeds are statistically significant because the significance value is less than 0.008. Fertilizers and Pesticides are not statistically significant. Out of these two, fertilizers have a negative relation with food grains i.e. with per unit increase in fertilizers the production will decline by 0.494 units. On the basis of the above explanation the multiple regression model is

$$Y = 166.278 + 42.448 (\text{quality seeds}) - .956 (\text{Fertilizers}) + 424.969 (\text{Pesticides})$$

(3.858*) (3.128*) (-.494*) (.632*)

t-values are given in parenthesis

*indicates 5 percent level of significance

Ultimately, it is concluded that with the increase in usage of quality seeds the output will increase. While with every increase in doses of fertilizers only the cost of production will increase but not the production. With the increase in production (increase in quality seeds and lesser use of fertilizers) it is expected that profitability of the farmers may increase.

10. Conclusion

The Government has implemented various measures to liberate farmers from the trap of agrarian distress. It is trying to double the incomes of farmers by giving cheaper credit facilities, crop insurance, MSP for their products. Moreover, the PM Kisan Scheme gives Rs. 6000/- annually to every farmer. Still, one cannot deny the fact that productivity of Indian agriculture is declining day by day and ultimately it will affect the total production. Therefore, a second green revolution is required, in order to deal with the problem of declining productivity. The conversion from inorganic agriculture to organic one will deal with the food problem, high energy cost, underground water contamination, soil erosion, low productivity³, low farm incomes and risk to human life. In America, in 1980, the Department of Agriculture (USDA) estimated, that between 20,000 to 30,000 of the farmers practiced non-conventional (organic agriculture) agriculture which formed one percent of the total population. Now the figure has doubled or trebled. Farmers who practiced non-conventional cultivation, reduced the use of chemical fertilisers and pesticides and lesser mechanical energy, have reported that their cost of production is lower than their nearby farms who used chemical fertilisers, insecticides and mechanical energy (John P. Reganold, Robert I. Papendick 1990). In early years, their production was lower as compared to other farmers, but the loss was compensated by the lower cost of production which ultimately led to higher net profits Filippo (Sgroi et. al. 2015).

It needs no emphasis that the cause behind unfavourable terms of trade of agriculture is more use of industrial goods by the agriculturist as compared to their industrial counterparts. Expansion of the market ultimately leads to a broader benefit to the society but here use of the industrial goods leads to lowering of productivity of the soil which not only leads to increased cost for the farmers but also a hidden cost for the future generations. So, steps need to be taken not only for the betterment of farmers but also society. It will on one hand secure our present generation on the other takes care of the future. There are two ways which can sort out the problem of distress felt by the farming community, first one is the proportionate use of chemical fertilisers and pesticides and other one is total replacement of chemical fertilisers by organic manures and pesticides. However, complete replacement of chemical fertilisers and pesticides by their organic substitutes is a very difficult task but use of chemicals in a right proportion can be adopted with a little planning. Here the Government is required to take up the leading role in order to make the producer choose the rational combination. The Government should restructure the subsidy provided to the agriculture sector. As the potassic and phosphatic fertilisers are used more or less in the desired proportion but nitrogenous fertilisers are used more than the rational quantity. Therefore, subsidy on nitrogenous fertilisers should be reduced so that farmers use it in lesser quantity at the same time use of micronutrients should be encouraged (by giving subsidy) to make the soil more productive. It is in broader national interest that the process of production should be made less costly through organic farming. It is equally important that the farmers should be motivated to produce organic manures themselves with the help of agricultural wastes, it will not only take care of the present economic condition of farmers but also the coming generations.

REFERENCES:

1. Howard, An Agricultural Testament, P.210. also see Mamoria, C.B. and Badri Bishal Tripathi (2003) Agriculture Problems in India, p.201
2. Amartya Sen (2010), Development as Freedom, p.205-2015.

3. Amit Kumar, Damodar Saur and Bimal Kishore Sahoo, National Food Security act, 2013: Problems and Prospects, Engage/Social Action 3,(6):265-275, Dec, 2018
4. Arnold 2009, The Green Revolution: The Companion to Development Studies, p.156
5. Blair A, Axelson O, Franklin C, et al. Carcinogenic effects of pesticides. In: Baker SR, Wilkinson CF, eds.
6. Business Standard, Vol.IV, NO.271, 22 April, 2010, also see Ellina Samantroy and Indu Upadhyay (2012), Globalisation and Social Change, P.38
7. Chand, R., Srivastava, S. K., & Singh, J. (2017). Changing structure of rural economy of India implications for employment and growth. New Delhi: NITI Aayog. Google Scholar also see link.springer.com/chapter/10.1007/978-3-030-14409-8_3
8. De Janvry, A. and Subbarao, K., (1986) Agricultural Price Policy and Income Distribution in India, Studies in Economic Planning (1986), Oxford University Press, New Delhi.,
9. Dimitri, C., A. Effland and N. Conklin (2005), The 20th Century Transformation of U.S. Agriculture and Farm Policy, Economic Information Bulletin Number 3, Economic Research Service, U.S. Department of Agriculture, Washington, D.C., available at www.ers.usda.gov/Publications/EIB3/.
10. downtoearth.org.in/news/indias-deepening-farm-crisis-76-farmers-want-to-give-up-farming-shows-study-43728, 12 March 2018
11. economictimes.indiatimes.com/news/economy/policy/fm-reveals-formula-for-fixing-msp-50-over-production-cost/articleshow/62855155.cms?from=mdr, Last Updated: Feb 09, 2018,
12. economictimes.indiatimes.com/news/politics-and-nation/at-217-million-india-houses-largest-number-of-malnourished-in-the-world/articleshow/16750064.cms?from=mdr, by Rukman Srinivasan, last updated on Oct 10, 2012, 12:02,
13. Evaluation Study on Efficacy of Minimum Support Prices (MSP) on Farmers (DMEO Report No.231, Niti Ayog, January, 2016, p.1.
14. Eve Crowley, (2013), Ending poverty: Learning from good practices of the small and marginal farmers, the Food and Agriculture Organization and Self-Employed Women's Association's (SEWA) Exposure and Dialogue Programme.
15. Filippo Sgroi *, Matteo Candela, Anna Maria Di Trapani, Mario Foderà, Riccardo Squatrito, Riccardo Testa and Salvatore Tudisca, Economic and Financial Comparison between Organic and Conventional Farming in Sicilian Lemon Orchards, Sustainability 2015, p.952

FOOD SECURITY IN INDIA

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ABSTRACT

India was able to increase food production through green revolution and achieved self-sufficiency in food grain production. It needs no emphasis that in spite of increase in production still hunger from Indian economy could not be alleviated. This paper is an attempt to look into the cause of increase in malnutrition in India and suggest measures alleviate it.

Keywords : Food Security, Demand Deficit, Malnutrition.

I. INTRODUCTION

Food, clothing and shelter are the basic needs of humanity. Food is first in the priority list therefore Indian Constitution has made right to food, a fundamental right. Unfortunately after more than seventy years of independence the problem of food has remained unsolved. It has been estimated that every third person in Asia suffers from hunger and much larger is the problem of malnutrition. It needs no emphasis that malnutrition, starvation and occasional famines were more or less like epidemics for India. "During the last 300 hundred years, India has experienced 26 major famines; and during the last 700 years, there have been 17 very severe food disasters; and during the historical times of the 34 great famines of the world 18 have occurred in India. The frequency and cyclical order show the particular susceptibility of this country to crop failures and recurrent shortage of food supply". The cause of the scarcities and famines in 19th century was not only due to lack of food production but also due to the lack of transportation facilities which could bring about equilibrium in demand and supply in different parts of India.

It should however be pointed out that in the initial years of nineteenth century India was in a comfortable

position regarding the availability of food grains but in 1880, famine commission warned about occurrence of a situation of famine due to excessive increase in population. The position was in control until 1921, after it the population increased at a greater speed. The position was under control due to the increase in food production. Between 1920-21 to 1939-40 the average annual growth of exports was 9.8 lakh tonnes in 1921-25 it declined to 6.9 lakh tonnes in 1939-40 imports increased from 1.4 m tonnes to 207 m tonnes. Position further went on taking a bad shape because the population increased at an alarming rate leading to declining the per capita availability of food grains. It seems the theory given by Malthus has come true now a day. According to Malthus the production of food grains increases arithmetically whereas the population increases geometrically. The cause behind problem of hunger was rate of population growth surpassing foodgrains.

This paper is an attempt to study the availability of food grains in India. It tries to explore as to adequate amount of foodgrains are available to all the citizens. The paper tries to explore the reasons of malnutrition in India and suggest various measures that should be undertaken to sort out the problem of malnutrition in the country.

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II. OBJECTIVES

1. To study the position of food security in India.
2. To analyse the causes of malnutrition in India.
3. To suggest various measures to eliminate malnutrition from India.

III. METHODOLOGY

The study is based on secondary source of information. Data is collected from Human Development Report India, Economic Survey, Agriculture Statistics at Glance, and Food and Nutritional Security Analysis. The

A. Position of Food Security in India

data collected are classified into tables. In order to analyse the data various statistical tools like percentage average and regression are used. The paper is divided into three sections. I section deals with the position of food security in India. It deals with the adequacy of foodgrains for the citizens of India. II section deals with problem of malnutrition in India while the III section focuses on the suggestion and recommendations for reducing malnutrition in the country.

TABLE I
NET PRODUCTION, IMPORTS and AVAILABILITY of FOODGRAINS

Year	Population (million)	Cereals				Pulses	Per Capita Net Availability per day (grams)		
		Net Production (Million Tonnes)	Net Imports (Million Tonnes)	Change in Government Stocks (Million Tonnes)	Net Availability (Million Tonnes)	Net Availability (Million Tonnes)	Cereals	Pulses	Total
		3	4	5	6	7	8	9	10
1951	363.2	40.1	4.1	0.6	43.6	8.0	334.2	60.7	394.9
1961	442.4	60.9	3.5	(-)0.2	64.6	11.1	399.7	69.0	468.7
1971	551.3	84.5	2.0	(+)2.6	84.0	10.3	417.6	51.2	468.8
1981	688.5	104.1	0.5	(-)0.2	104.8	9.4	417.3	37.5	454.8
1991	851.7	141.9	(-)0.6	(-)4.4	145.7	12.9	468.5	41.6	510.1
2001	1033.2	162.5	(-)4.5	(+)12.3	145.6	11.3	386.2	30.0	416.2
2005	1102.8	162.1	(-)7.2	(-)2.4	157.3	12.7	390.9	31.5	422.4
2010	1185.8	178.0	(-)4.7	(-)0.5	173.8	15.3	401.7	35.4	437.1
2015	1259.1	205.5	(-)12.4	(-)0.5	193.6	20.1	421.4	43.8	465.1
2016	1273.9	205.8	(-)8.7	(-)9.2	206.3	20.3	443.7	43.6	487.3
2017	1288.5	221.1	(-)5.1	(+)3.6	212.4	25.6	451.7	54.4	506.1

Notes:

P: Provisional

+1. Population figure relates to mid year

2. The net availability of foodgrains is estimated to be gross production (-) seed, feed and wastage, (-) exports (+) imports (+/-) change in stocks.

3. The net availability of foodgrains divided by the population estimates for a particular year indicates per capita availability of foodgrains in terms of Kg /year.

4. Figures in respect of per capita net availability given above are not strictly representative of actual

level of consumption in the country especially as they do not take into account any change in stocks in possession of traders, procedures and consumers.

5. For calculation of per capita net availability of net imports from 1981 to 1994 are based on imports and exports on Government of India account only. Net imports from 1995 are, however, based on the total exports and imports (both Government as

well as Private accounts).

Table I shows the net production, imports and availability of food grains. In 1951 the net availability of production was 48.1 million tonnes which increased by 387 percent during a time period of 67 years. The net availability of foodgrains depict a very rosy picture but taking into account only food grains give only a partial picture, unless and until we see the effect of population on availability. Per capita availability of foodgrains gives almost complete picture of availability. Per capita net availability of cereals was 334.2 gms/day which increased to 451.7 gms/day. On the other hand per capita availability of pulses, in 1951 was 61.7 gms/day which showed a negative growth and declined to 54.4 gms/day. If we take a look at the ideal requirement in Indian conditions, an adult man doing heavy work requires 670 gms cereals/day on the other hand an adult women

requires 575 gms/day and 60 and 50 gms pulses respectively. Though the foodgrains have multiplied tremendously during the planning period but it is not matching the requirement in terms of balanced diet in Indian conditions. It needs no emphasis that the production increased at great pace after adoption of green revolution which can be seen from the availability of food grains but the per capita availability of cereal and pulses clearly indicates that still much has to be done towards the production of both specially pulses, as it has declined during the course of time.

The availability of food grains is the most important factor which determines the productivity of an individual. Since the availability of food grains is not matching the requirements therefore the only way left is import of food grains.

TABLE II
IMPORTS and EXPORTS of PRINCIPAL AGRICULTURAL COMMODITIES (VALUE in RS. CRORE)

Year	Agricultural Imports	% of Agricultural Imports to Total National Imports	Agricultural Exports	% of Agricultural Imports to Total National Exports
1990-91	1205.86	2.79	6012.76	18.49
1991-92	1478.27	3.09	7838.04	17.80
1992-93	2876.25	4.54	9040.30	16.84
1993-94	2327.33	3.18	12586.55	18.05
1994-95	5937.21	6.60	13222.76	15.99
1995-96	5890.10	4.80	20397.74	19.18
1996-97	6612.60	4.76	24161.29	20.33
1997-98	8784.19	5.70	24832.45	19.09
1998-99	14566.48	8.17	25510.64	18.25
1999-00	16066.73	7.45	25313.66	15.91
2000-01	12086.23	5.29	28657.37	14.23
2001-02	16256.61	6.63	29728.61	14.22
2002-03	17608.83	5.92	34653.94	13.58
2003-04	21972.68	6.12	36415.48	12.41
2004-05	22811.84	4.55	41602.65	11.08
2005-06	15977.75	2.42	45710.97	10.02
2006-07	23000.28	2.74	57767.87	10.10
2007-08	22549.81	2.23	74673.48	11.39
2008-09	28719.24	2.09	81064.52	9.64
2009-10	54365.29	3.99	84443.95	9.99
2010-11	51073.97	3.03	113046.58	9.94
2011-12	70164.51	2.99	182801.00	12.47
2012-13	95718.89	3.59	227192.61	13.90
2013-14	85727.30	3.16	262778.54	13.79
2014-15	121319.02	4.43	239681.04	12.64
2015-16	140289.22	5.63	215396.32	12.55
2016-17	164726.83	6.39	226651	12.26
2017-18 (P)	152095.20	5.07	251563.94	12.86

with position of export and import of commodities in India. The strength of any economy depends upon its contribution of economy towards the world economy. Agricultural position in Indian economy shows a glorious face since it is exporting more than what it is importing. In 1990-91 the share of agricultural imports in total imports was 2.79 percent which increased to 4.80 percent 1995-96. It further increased to 5.29 percent in 2001-02 which declined to 2.42 percent in 2005-06. There was slight increase of 3.03 percent in 2010-11 which again showed an upward trend and increased to 5.63 percent in 2015-16. The year 2016-17 registered an increase by 0.76 percentage point followed by a fall of 1.32 points in 2017-18. The percentage of imports as a percentage of exports was 18.49 percent in 1990-91. The share declined to 14.23 percent in 2000-01. It further declined to 9.94 percent. After that there was an increase in share of agricultural imports, it increased to 12.47 percent in 2011-12 to 12.64 percent in 2014-15 and in 2017-18 the share increased by 0.22 points and became 12.86 percent. The table shows a glorious position where exports are more than imports. India enjoys a leading position in agricultural exports in world. Its total agricultural exports is approximately 2.15 percent of the world agricultural trade. Its major export partners are USA, Saudi Arabia, Iran, Nepal and Bangladesh. It should however be

pointed out that export is a good indicator of development but the requirement of the citizens should be given first priority. It is clear from the above table that there is a mismatch in demand and supply of food grains which may result in malnutrition amongst the people.

A. Problem of Malnutrition in India

Expenditure is one of the indicators which reveals the position of poverty. According to Engel law the expenditure on food declines with the increase in purchasing power. A higher share of expenditure on food reveals lower purchasing power on the contrary lower share of income on food shows a higher purchasing power. On an average people of India allocate 49 percent of their income on food while in urban areas it is 39 percent. It was found that on one hand the expenditure on food in rural areas have declined by 33 percent and 40 percent in urban areas and on the other expenditure on non-food items increased in the meantime. Amongst the lowest 30 percent of the income and expenditure class average per capita consumption was 1811 kcal/day which is much lower than what is prescribed by Indian Council of Medical Research which is equal to 2155 kcal/day. For urban area the required limit is 2090/day while the energy taken is 1745 kcal/day. Due to intake of lesser energy than required causes malnutrition amongst the children in form of stunting, wasting and underweight.

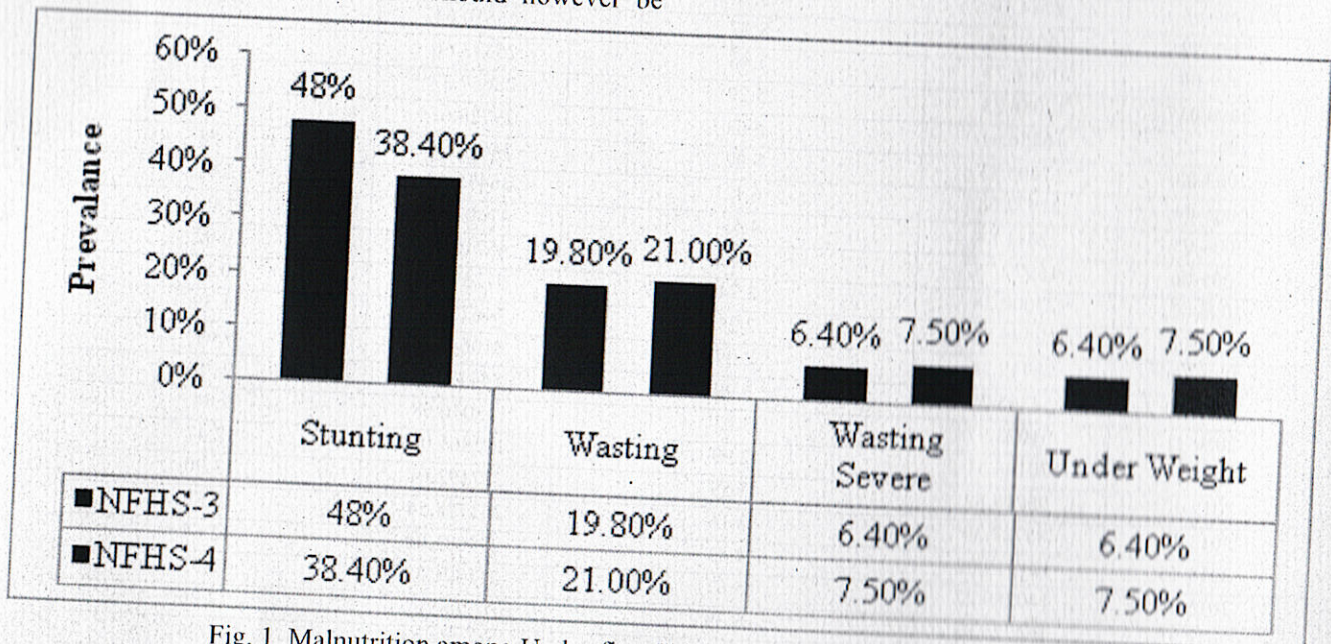


Fig. 1 Malnutrition among Under-five Children in India, 2005-06 and 2015-16

Fig 1 shows a comparative analysis of NFHS 3 and NFHS 4, 48 percent of the children were stunted in NFHS-3 which declined to 38.40 in NFHS-4. 19.80 percent were having the problem of wasting in NFHS-3 which increased to 21 percent in NFHS-4. 6.4 percent children were underweight in NFHS-3 which increased to 7.5 percent in NFHS-4. It needs no emphasis that malnutrition depends more or less on income and expenditure. It was found that the more under nourished under five children were found in rural areas as compared to urban ones. If one looks from social point of view more children belonging to ST category were found under nourished.

A. Focuses on the Suggestion and Recommendations for Reducing Malnutrition in the Country

It should however be pointed out that no doubt India has increased the production of food grains tremendously by application of mechanical, chemical and biological revolution but it has not solved the problem of hunger even after almost seventy years of independence. Initially, India had to face the challenge of single malnutrition but now it has to deal with double malnutrition. The problem is under nourishment which have the characteristics shown in diagram 1.1 the other is over nutrition where there is problem of overweight and obesity. The problem of obesity is more in case of women. The problem in women in India is low BMI and anaemia on one hand on the other is problem of obesity. During 2005-16 the problem of low BMI has declined from 35.5 percent to 22.9 percent in women and men 34.2 to 20.2 percent in India. The low BMI problem was more in rural areas & among people from lowest income quintile and in social category ST while the problem of obesity and overweight was more prevalent in urban and richer sections (highest quintile). According to NFHS - 4 the low BMI was a prevalent in Jharkhand (31.6percent) followed by Bihar (30.5 percent), Rajasthan (28.4 percent) while Andhra Pradesh (33.2 percent) and Kerala (32.4 percent) has the problem of over nutrition. It is very clear that the income is directly related to malnutrition the high income group and richer class are having the problem of over nutrition while lower income group and

people from lower social strata face the problem of under nutrition. Similarly, the richer States face the problem of over nutrition while poorer have to face under nutrition.

It is clear that always food problem is not the cause behind malnutrition. It means that the total supply of agricultural commodities may be sufficient to fulfil the needs but there may be problem in proper distribution of food grains. Since the problem is with the underdeveloped States, lower strata of the society, and with the rural areas therefore the public distribution system should be made stronger especially in rural areas. Government should take an initiative to provide food for work under MGNAREGA, strengthen midday meal programme in Government schools and make availability of nourished food for pregnant and lactating mothers. The other way is regarding production of more food in order to match between demand and supply. In order to increase production, the chemical application is leading to decline in productivity and leads to various health problems. Therefore, organic agriculture needs to be encouraged to increase productivity in agriculture. It is in broader national interest that malnutrition needs to be tackled by increase in public expenditure on availability of food grains and on encouragement of organic agriculture.

References :

1. Agricultural Statistics at a Glance (2018)
2. Census of India Report (1951), pt. I.A
3. Directorate General of Commercial Intelligence & Statistics, Department of Commerce. (P)-Provisional
4. Directorate of Economics & Statistics, Department of Agriculture, Cooperation & Farmers Welfare
5. Economic Survey, Government of India, 2017-18
6. Food and Nutritional Security Analysis India 2019
7. <http://eagri.org/eagri50/AECO141/lec07.pdf>
8. <https://economictimes.indiatimes.com/news/economy/agriculture/economic-survey-suggests-to-boost-agri-exports/articleshow/73800027.cms> by Rituraj Tiwari, ET Bureau, Last updated Jan 21, 2020, 2:42 PM IST
9. <http://www.fao.org/3/x0172e/x0172e02.htm>
10. Mamoria, C.B & Badri Bishal Tripathi (2003) Agricultural Problems in India, Kitab Mahal,

Sarojini Naidu Marg, Allahabad

11. Mehta CR, NS Chandel, PC Jena, A Jha,(2019)
Indian Agriculture Counting on Farm
Mechanisation
12. National Family Health Survey,2005-06 and 2015-
16
13. Report of the Famine Commission of India (1880)
14. S.S Chauhan, The Food Problem, (1958)

15. Thomas Robert Malthus, "Essays on the Principle
of Population" As it Affects the Future
Improvement of Society, with remarks on
Speculation of Mr. Godwin, M. Condercet and
Other Writers (London: j. Johnson, 1798), chapter
8 in the Penguin classics edition, An Essay on the
Principle of Population ed. Anthony Flew.,1982,
The Works of Thomas Robert Malthus, ed. EA
Wrigley and David Souden,1986.



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Rethinking Policy for Underfed and Undernourished

Dr. Indu Upadhyay^{*}

Indian agriculture has come a long way since inception of planning since 1951. At that time the concern was self - sufficiency in food rather than development because we lived in a society which was suffering from absolute shortage of food. The policy of self-sufficiency was absolutely correct since the economy was severely suffering from shortage of food grains and in order to overcome the shortage the average annual import of wheat in 1960 was around three million tonnes. Thanks to Green Revolution which helped the country to increase the production of food grains. We survived due to the generous behaviour of America which supplied wheat through PL480 programme. Green Revolution happened to be the game changer which not only made our country self sufficient in food production but also made the country surplus in food production. This made a transformation of our country from a food shortage country to food surplus country.

It should however be pointed out that there is a need to look from various angles to evaluate the success of our food policy. If the poverty, infant mortality and maternal mortality has declined to a sizeable amount than the food policy adopted by the Government has become really successful. The role of providing food is of great importance because it helps in achieving inclusive growth. A person who is healthy is more productive than a person who is unhealthy. Therefore, it is the duty of Government to provide three things in order to make the process of development more inclusive they are adequate food, health care and education. No doubt, the Government's effort towards inclusive growth is commendable after independence still there is a need to think about food security when we have adopted economic reform for development whether the social expenditure for inclusive development is enough or not. This paper is an attempt to examine whether the help provided by the Government is enough for upliftment of the citizens or more assistance is required in the form of food security. Since food is a private good therefore principle of exclusion is applicable on it. It is needless to say that due to this reason a poor economy will be badly affected. Here, it is the duty of the Government to see whether the food is reaching the people in an adequate quantity or not. It should however be pointed out that hunger index is one of the indicators which reflects the position of inclusive development.

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Rethinking Policy for Underfed and Undernourished

Index of Selected Indian States, 2008

	Prevalence of Calorie Under Nourishment (per cent)	Proportion of Underweight Children Less than 5 years of Age (per cent)	Under Five Mortality Rate (Per 100)	Hunger Index (HI)	Rank as Per HI
	11.1	24.6	5.2	13.63	1
	28.6	22.7	1.6	17.63	2
	19.6	32.7	6.3	19.53	3
	14.6	36.4	8.5	19.83	4
	15.1	39.7	5.2	20.00	5
	29.1	30.0	3.5	20.87	6
	14.0	40.4	8.5	20.97	7
	18.5	38.5	5.9	20.97	8
	14.5	42.3	9.6	22.13	9
	27.0	36.7	4.7	22.80	10
	28.1	37.6	5.5	23.73	11
	21.4	40.9	9.1	23.80	12
	23.3	44.7	6.1	24.70	13
	25.3	47.6	9.0	26.73	14
	17.3	56.1	8.5	27.30	15
	19.6	57.1	9.3	28.7	16
	23.4	59.8	9.4	30.87	17
	20.0	42.3	7.4	25.30	

Menon *et al.* (2009)., Human Development Report India, 2011, p.131

It is clearly visible that even the richer State like Punjab are not able to deal with the problem of hunger. Now this makes a question mark as to how the hunger is persistent in a country when the country has become a food grain sufficient country.

Indicators of Nutrition	2005-6			1998-9		
	Urban	Rural	Total	Urban	Rural	Total
Stunted (Height-for-age)						
Percentage below - 3 SD	16.4	23.8	22	19.7	30.2	27.7
Percentage below - 2 SD	37.4	47.2	44.9	41.1	54	51
Wasted (Weight-for-height)						
Percentage below - 3 SD	6.8	8.3	7.9	5.3	7.1	6.7
Percentage below - 2 SD	19	24.1	22.9	16.3	20.7	19.7
Underweight (Weight-for-age)						
Percentage below - 3 SD	10.6	17.4	15.8	11.3	19.6	17.6
Percentage below - 2 SD	30.1	43.7	40.4	34.1	45.3	42.7

Source: NFHS 3 and NFHS 2.

Note: In NFHS 2, the nutritional status of children was measured only for the last two children less than three years of age of ever-married women who were interviewed, whereas in NFHS-3, all children in the household under five years of age were eligible to be measured. Therefore, when comparing the nutritional indicators in the two surveys, it is necessary to restrict the calculations to the NFHS-2 criteria for eligibility.

It needs no emphasis that intake of food makes a child healthy mentally as well as physically, a child not taking sufficient nutritious food makes him stunted and low weighed according to his age which excludes the child from the race of development in a very initial phase. If the child has an anthropometric measurement that is far (that is, between two and three standard deviations) below the average value for the reference population, the child is considered chronically undernourished. If the indicator is more than three standard deviations below the average value for the reference population, then she is considered severely undernourished. A child who is stunted (low height for age) suffers from chronic undernourishment, which cannot be overcome by short-term alterations in the diet, whereas wasting (low weight for height) is a situation where undernourishment is short-term and slight alterations in the nutrient intake can help overcome it. It is a matter of concern that the percentage of severely stunted children and severely underweight children in the country stood at 22 per cent and 16 per cent, respectively, in 2005-6 (as per the new international reference population released by the WHO). Now the question arises as to why the number of children who are an important component of their family are on a risk. It needs no

Rethinking Policy for Underfed and Undernourished

that the condition of the family can be easily understood when the condition of the important component of the family is so miserable. It should however be pointed out that the condition of the citizens is deplorable to this extent when the country has sufficient in food production.

Availability of Cereals and Pulses

Year	Cereals				Pulses	Per Capita Availability(per gram)		
	Net production(million tonnes)	Net Imports(million tonnes)	Change in Government Stock(million tonnes)	Net Availability(million tonnes)	Net Availability(million tonnes)	Cereals	Pulses	Total
1951	40.1	4.1	0.6	44.3	8.0	334.2	60.7	394.9
1952	50.4	1.4	-0.6	52.4	10.2	360.4	70.3	430.7
1953	60.9	3.5	-0.2	64.6	11.1	399.7	69.0	468.7
1954	54.6	10.3	0.1	64.8	8.7	359.9	48.2	408.1
1955	84.5	2.0	2.6	84.0	10.3	417.6	51.2	468.8
1956	94.5	0.7	0.7	84.4	11.4	373.8	50.5	424.3
1957	104.1	0.5	-0.2	104.8	9.4	417.3	37.5	454.8
1958	119.9	-0.1	-1.6	121.5	12.3	434.2	43.9	478.1
1959	141.9	-0.6	-4.4	145.7	12.9	468.5	41.6	510.1
1960	147.1	-3.5	-8.5	152.1	11.3	442.5	32.7	475.2
1961	162.5	-4.5	2.3	145.6	11.3	386.2	30.0	416.2
1962	174.5	-8.5	-9.9	175.9	13.6	458.7	35.4	494.1
1963	143.2	-7.1	-23.2	159.3	11.3	408.5	29.1	437.6
1964	173.5	-7.7	-3.3	169.1	14.2	426.9	35.8	462.7
1965	162.1	-7.2	-2.4	157.3	12.7	390.9	31.5	422.4
1966	170.8	-3.8	-1.8	168.8	13.3	412.8	32.5	445.3
1967	177.7	-7.0	1.7	169.0	14.7	407.4	35.5	442.8
1968	189.0	-4.4	17.0	157.6	17.6	374.6	41.8	436.0

Directorate of Economics and Statistics, Department of Agriculture and Cooperation,

of India, also reported in Economic Survey, 2009-10
Population figures relates to mid year.

The population of 1961 stood at 363.2 million which has increased to 1153.1 million in 2009 the production of food grains has also increased from 40.1 million tonnes to 189 million tonnes during the mean time. It is indeed a happy sign that during the mentioned the net imports declined from 4.1 million tonnes to -4.4 million tonnes. Net availability of food grains increased almost four times from 44.3 million tonnes to 157.6 million tonnes. It needs no emphasis that a plate of balanced diet not only includes carbohydrates but also proteins, minerals and vitamins. The happy news is that the net availability of pulses has more than doubled from 8 million tonnes to 17.6 million tonnes. Net availability of food grains is not enough for understanding the living standard of the country what is required is the calculation of per capita availability of the food grains. This is a rather gloomy picture of the Indian economy because the per capita net availability of food grains was 334.2 grams per day in 1951 which has increased only by only 40.4 grams and stood at 374.7 gram per day. The position of the per capita net availability of pulses is worse than cereals the per capita availability of pulses was 60.7 grams/day which

got reduced to 41.8 million tonnes. The position of hunger can be easily understood by the fact the calorie received in 374.6 gm of rice is 1292.37 Kcal and the per capita availability of pulses is 41.8 gm which gives 148.39 Kcal.¹ With the provision of this much food grain the belly of an individual can be filled but cannot provide enough energy to work efficiently.

It should however be pointed out that food security can be ensured by not only producing large quantum of food grains but also by facilitating the access of the same to poor. The agricultural development today is based on the philosophy of market which motivates the policy maker to increase production of food grains without thinking of as to how it will reach the poor and needy. The ways adopted might decrease the fiscal deficit to some extent but at the same time increase the hunger. Therefore, it is in broader national interest to make the process of development more inclusive and rethink the ways to provide food to the needy.

Reference

- Human Development Report, 2011
- NFHS 3 and NFHS 2 (National Family Health Survey)
- Directorate of Economics and Statics, Department of Agriculture and Cooperation, Registrar General of India, also reported in Economic Survey, 2009-10



¹Rao, Narasinga, B.S.Y.GDeosthale and K.C.Pant, Nutritive Value of Indian Foods, National Institute of Nutrition, Indian Council of Medical Research, Hyderabad, p.47, 1999

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Private Healthcare in Him

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Private institutions dominate inpatients, both in the rural and urban areas. However, despite the growth of Himachal Pradesh, are government health care facilities. This study aims to understand the private sector in the state. From the study, it was found that the private hospitals are earning very little surplus over the years. The large chunk of the total revenue goes to the commission or fee charged by the specialist/professionals. The prices charged for similar services in private hospitals significantly higher than those existing between the state and the private sector.

Introduction

The growth of private healthcare services has been rapid in recent years, for reasons including inefficient public provision, the need for specialized services said to be responsible for this trend. The government has been providing these services through the central government corporations and other local bodies. The private sector is becoming more homogenous. Private health care services are provided by Unregistered Practitioners of Indian System of Medicine, Registered Practitioners of Tertiary Care Multi Specialty Hospitals. In recent years, the growth has been rapid. The availability and utilization of private health care services has increased. The availability and utilization of private health care services has increased.

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Education System in India: The Need of the Era
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Review
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Restructuring Education System in India: The Need of the Era

Indu Upadhyay* & Varsha Yadav**

Abstract

This paper is an attempt to study the position of education in Indian economy. It needs no emphasis that in a globalised world the factor market are interlinked therefore there is a need to develop skill amongst the people to cope up with the needs of the market. The quality of education depends upon the quality of primary, secondary and higher education. Since, India is facing the problem of unemployment because of mal adjustment between the demand (of skills) and supply of labour. Therefore, the paper aims at studying the problems of education system in India and suggest measures to solve them. The paper is divided into three sections, first one deals with the introduction and second part examines the position and problems of primary, secondary & higher education in India, third section focuses on the analysis, conclusions and recommendations to sort out the problem.

Introduction: Modern States are welfare States and they wish to bring about development which will not only bring about change in way of life but also make the development inclusive in nature. Inclusive development means development where the fruits of development are shared by every member of the society. One way to bring about inclusive development is to provide inclusive education and health facility in an economy. Inclusive education presupposes, providing good quality education to all. Hence, inclusive education needs special attention in order to achieve inclusive development. Inclusive development requires better educational and health facilities to the citizens that is why Eleventh five year plan¹ emphasized on the need of inclusive educational and health facilities. Planning Commission very rightly felt that education is one of the equalisers in the society. The economy needs to look beyond universalisation of primary education, a strong secondary and

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1 Eleventh Five year plan, Planning Commission, Government of India, 2007-12

education is equally important for making the process of development inclusive because education provides equal opportunity to all for development.

It needs no emphasis that Indian economy is experiencing a high growth of approx. 7.4 percent per annum, and anticipated to grow at a higher rate in near future. It is already being considered as a transforming economy, one of the best performing economies of the world, and is not considered under developed economy any more.² The impressive economic growth under economic reforms being vigorously followed also lead to the fear of high growth which is exclusionary in nature and be characterized by jobless, class, voiceless, rootless and the futureless growth according to United Nations Development Programme (UNDP, 1996).³ Indian economy is growing at a great speed but the development is not including all the sections of the society equally. Now, India is facing a stunning growth rate but the growth is of uneven nature.⁴ It has been very rightly said by World Bank about the Indian economy, as a booming economy with growing gaps.⁵

Modern economy is knowledge driven where both formal and informal education is playing a vital role in encouraging economic solidarity, social cohesion, individual development and sustainable development. Therefore, a paradigm needs to be evolved that is developmental, human centric, environmentally sound and inclusive so as to make the learner contributor to the knowledge economy rather than a recipient in the knowledge economy. It has opened new challenges as well as opportunities to the whole educational system especially higher education in India may it be private or public educational institutions. The higher education of any economy is one of the important forces which leads to social mobility in favour of or against employment. Sound educational system paves the way to desired career. It may however be pointed out that Indian higher education system is facing a serious type of paradox, on one hand the system has IITs and IIMs which are globally recognised for their academic achievements on the other hand we have many schools which do not have access to even basic infrastructure. It needs no emphasis that quality of higher education becomes a pre-condition for employment in any economy therefore there is a need to restructure the system of education to accelerate employment. Structuring

only the higher education. It needs no emphasis on the quality of primary and secondary education to be taken in order to improve employment position.

Methodology: The data has been collected from various sources. Education, Educational Statistics, India: Progress towards Education for All, represented in form of statistical tools like averages. The data is divided into three sections, first one on primary education, the position and problems of secondary and higher education, and the recommendations of the

Social Groups	Male	
	1999-2000	
	Rural	Urban
Scheduled Castes	58.8	76.0
Scheduled Tribe	53.8	78.1
Other Backward Classes	67.8	83.5
Others	78.1	91.4
	67.8	86.5

Source: NSSO 55th Round, Round (for 2007-08).

Table 1.1 shows the literacy rate of females. It is clear that the literacy rate in India is lesser for the women than the men. That after more than seventy percent literacy rate. The

¹ Ministry of India, New Delhi, July 25, 2007

² UNDP, Human Development Report, New York 1996.

³ UNDP (2007): Asian Experience on Growth, Employment and Poverty: An Overview with special Reference to the findings of some recent studies, Colombo, UNDP/Geneva.

⁴ World Bank: India: Inclusive Growth And Service Delivery: Building on India's Success - Employment Policy Review, Report No. 34580-IN, Washington DC.

only the higher education will not bring about change in the desired direction. It needs no emphasis that the quality of higher education depends on the quality of primary and secondary education. Therefore, a holistic view needs to be taken in order to improve not only the higher education but also the employment position.

Methodology: The paper is based on secondary source of information. The data has been collected from various reports such as Annual Status of Education, Educational Statistics at a Glance, and Secondary Education in India: Progress towards Universalisation etc. The data collected is represented in form of various tables. The analysis is done on the basis of statistical tools like average and percentage etc. The paper is divided into three sections, first one deals with introduction and second section examines the position and problems in the educational system of India (primary, secondary and higher education) while the third part focuses on analysis and recommendations of the study.

Table 1.1
Literacy Rate by Social Groups (percent)

Social Groups	Male				Female				Person			
	1999-2000		2007-2008		1999-2000		2007-2008		1999-2000		2007-2008	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Scheduled Castes	58.8	76.0	70.6	83.1	36.6	55.7	49.9	66.1	46.6	66.2	60.5	74.9
Scheduled Tribe	53.8	78.1	69.3	86.0	30.1	61.2	47.8	69.0	42.2	70.0	58.8	78.0
Other Backward Classes	67.8	83.5	77.7	88.3	41.1	66.4	55.4	74.6	54.8	75.3	66.7	81.7
Others	78.1	91.4	84.6	93.8	56.7	81.0	68.8	85.5	67.7	86.5	76.9	89.9
	67.8	86.5	77.0	89.9	43.4	72.3	56.7	78.0	56.0	79.8	67.0	84.3

Source: NSSO 55th Round, Report No. 473 (for 1999-2000) and calculated from Database 64th Round (for 2007-08).

Table 1.1 shows the literacy rate by social groups, if we compare the literacy rate of females of any category with their male counterparts we find that the literacy rate in each and every category and every year the literacy rate is lesser for the women as compared to the males. It is worth mentioning that after more than seventy year of independence we have not achieved cent percent literacy rate. The characteristics of Indian education system is that the

literacy rate of women in all the social categories is lesser as compared to male counterparts. The literacy rate of women in rural areas is lesser as compared to the women in urban areas. The condition of female of weaker section in terms of education is worse as compared to all social groups. The condition of female of SC and ST is bad as compared to all other groups. It is no emphasis that when India is the fastest growing economy of the world but the females who share half of the sky are still the marginalised section of the society who are not getting equal opportunities to grow. One of the reasons behind this may be that since the women share the major part of household responsibilities therefore they are not in the race to education. Therefore, in order to achieve inclusive development, that to on a sustainable basis it is important not only to develop literacy rate but also the educational quality as well. It should however be pointed out that educating a man means educating only one person but educating a women means educating the whole family. The literacy rate shows the opportunity towards individual and social development. Lower literacy of female of scheduled caste shows equal opportunity towards employment.

In this regard, the present paper is an attempt to look at the problems faced by the present day education system towards inclusive education. The present education system is the structure that prepares the people for employment. Therefore, a strong higher education system is required to make the economy stronger especially when the world is moving towards a knowledge economy. In a globalised economy the quality of higher education plays a great role in preparing the youth to face the challenges of globalisation. There are many factors on which the quality of higher education depends not only depend on the no. of teachers, infrastructure, teachers-student ratio, quality of labs etc. of higher education but also on the quality of primary and secondary education. The strength of higher education depends on the quality of primary and secondary education.

II

Primary Education

Primary education is the base of any education system. Quality of any education system depends on the quality of primary education of any country. Universalisation of primary education is one of the goals which has been kept under consideration since the inception of Indian Planning. Efforts were fruitful in the Sarva Siksha Abhiyan when the enrolment in primary section was taken to 100 percent. The efforts of the Government cannot be under estimated for bringing the enrolment to 100 percent. The mid-day meal and provision of free books and uniform gave a positive impetus towards cent percent enrolment.

Gross Enro

States	Boys
Andhra Pradesh	96.2
Arunachal Pradesh	143.2
Assam	97.2
Bihar	106.2
Chhattisgarh	127.2
Goa	121.2
Gujarat	127.2
Haryana	86.2
Himachal Pradesh	113.2
Jammu and Kashmir	105.2
Jharkhand	117.2
Karnataka	108.2
Kerala	93.2
Madhya Pradesh	153.2
Maharashtra	116.2
Manipur	166.2
Meghalaya	183.2
Mizoram	162.2
Nagaland	91.2
Orissa	116.2
Punjab	78.2
Rajasthan	125.2
Sikkim	143.2
Tamil Nadu	117.2
Tripura	146.2
Uttar Pradesh	117.2
Uttarakhand	119.2
West Bengal	102.2
A and N Islands	105.2
Chandigarh	97.2
Dadar & N Haveli	159.2
Daman and Diu	141.2
Delhi	105.2
Lakshadweep	59.2
Pondicherry	152.2
India	114.2

Source: Statistics of School

Table 1.2 shows the literacy rate in India while it was 65 percent and it was 108 percent as compared to the boys

Table 1.2
Gross Enrolment Ratio in Classes I-V, VI-VIII and I-VIII

States	I-V			V-VIII			I-VIII		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Andhra Pradesh	96.3	96.6	96.5	76.6	74.3	75.5	88.5	87.8	88.1
Arunachal Pradesh	143.6	129.3	136.6	91.1	78.2	84.7	125.5	11.4	118.6
Assam	97.6	99.2	98.4	67.6	63.5	65.6	86.1	85.7	85.9
Bihar	106.3	82.3	94.7	45.8	31.5	39.0	83.7	63.8	74.1
Chhattisgarh	127.2	119.1	123.2	92.7	82.3	87.6	114.3	105.5	109.9
Goa	121.6	117.5	119.6	96.5	90.5	93.6	110.6	105.9	108.3
Gujarat	127.9	111.3	120.1	82.5	67.5	75.4	110.6	94.6	103.1
Haryana	86.6	90.2	88.2	79.1	81.7	80.3	83.7	86.9	85.2
Himachal Pradesh	113.2	113.0	113.1	109.3	106.3	107.9	111.7	110.4	111.1
Jammu and Kashmir	105.8	100.3	103.1	70.9	58.4	64.9	91.8	83.4	87.8
Jharkhand	117.8	105.4	111.7	58.8	45.4	52.3	95.5	83.1	89.4
Karnataka	108.4	105.5	107.0	90.6	86.8	88.8	101.5	98.3	99.9
Kerala	93.1	93.8	93.4	101.0	96.8	98.9	96.0	94.9	95.5
Madhya Pradesh	153.7	146.9	150.4	101.6	90.0	96.0	134.1	125.8	130.1
Maharashtra	116.1	111.0	113.6	100.9	102.1	101.5	110.3	107.6	109.0
Manipur	166.7	160.4	163.6	106.1	99.1	102.6	143.2	136.7	140.0
Meghalaya	183.2	180.5	181.8	98.1	105.5	101.8	152.3	153.3	152.8
Mizoram	162.4	155.4	158.9	87.5	85.9	86.7	132.5	127.9	130.2
Nagaland	91.0	89.5	90.2	59.7	61.9	60.8	79.1	79.1	79.1
Orissa	116.4	111.7	114.1	79.1	70.3	74.8	102.0	95.6	98.9
Punjab	78.1	85.4	81.3	68.1	70.1	69.0	74.1	79.3	76.4
Rajasthan	125.3	119.1	122.4	92.2	65.5	79.6	112.9	99.2	106.4
Sikkim	143.5	144.6	144.1	67.6	79.1	73.2	111.6	117.3	114.4
Tamil Nadu	117.8	117.8	117.8	110.3	108.1	109.2	114.8	114.0	114.4
Tripura	146.3	139.7	143.1	86.3	86.2	86.2	121.8	117.9	119.9
Uttar Pradesh	117.9	109.2	113.7	59.6	46.9	53.6	95.6	85.8	90.8
Uttarakhand	119.2	125.7	122.3	91.4	92.8	92.1	108.5	112.9	110.6
West Bengal	102.1	103.4	102.8	70.0	71.9	70.9	89.7	91.4	90.5
A and Nislands	105.2	106.8	106.0	104.4	101.6	103.1	104.9	104.8	104.9
Chandigarh	97.7	80.8	89.5	72.5	74.4	73.4	87.4	78.4	83.1
Dadar&N Haveli	159.8	157.0	158.5	101.9	74.8	88.9	137.6	125.9	132.0
Daman and Diu	141.8	131.0	136.6	122.1	114.5	118.5	134.3	124.8	129.7
Delhi	105.7	105.9	105.8	90.4	96.9	93.3	99.8	102.6	101.1
Lakshadweep	59.4	60.4	59.9	59.2	58.9	59.1	59.3	59.9	59.6
Pondicherry	152.5	133.2	142.4	114.8	101.4	108.0	135.4	119.2	127.1
India	114.6	108.0	114.4	77.6	69.6	73.8	100.4	93.5	97.1

Source: Statistics of School Education-2006-07

Table 1.2 shows that the enrolment ratio of boys from I-V was 114.6 percent in India while enrolment of the girls for the same year was less by 6.6 percent and it was 108 percent. No doubt the enrolment of the girls was lesser as compared to the boys but the scheme (SSA) was able to achieve 100

ent enrolment. But the total enrolment ratio for VI-VIII got reduced to level 73.4 percent. Now the question arises as to why the dropout rate has been increasing when the Government is giving all kind of facilities like schools equipped with physical infrastructure and good quality teaching, provision of free books, copies, uniforms, mid-day meals. It should however be pointed out that the quality of education is also a cause of concern, the overall standard of education is well below global standards as revealed by PISA⁶ (Programme for International Student Assessment) 2009+ results. India and Tamil Nadu and Himachal Pradesh 72 and 73 out of 74 participants, were only better than Kyrgyzstan, exposes the gaps in our education system. PISA, which measures the knowledge and skills of 15-year-olds with questions designed to assess their problem-solving Capabilities, rates these states at the bottom, with the scores in Mathematics and Science falling well behind the OECD (Organisation for Economic Cooperation and Development) average. Shanghai-China tops the rankings followed by Singapore, while the Russian Federation is ranked at thirty-eighth⁷.

Table 1.3

Percentage of Children of Government Schools in Std. V who can read Std. II level text

	2008	2010	2012	2014	2016	2018
India	53.1	50.7	41.7	42.2	41.7	44.2
Andhra Pradesh	73.3	74.0	59.9	61.3	63.3	73.1
Assam	74.3	71.0	55.3	51.7	63.1	66
Bihar	61.1	60.7	43.5	53.9	54.6	58.1
Chhattisgarh	74.1	61.0	44.0	47.1	51.0	57.1
Goa	40.9	42.6	33.3	30.6	32.2	33.5
Gujarat	86.8	55.2	27.5	27.5	31.4	34.4
Haryana	42.9	42.9	47.2	45.7	41.9	47.6
Himachal Pradesh	73.6	75.7	71.2	71.5	65.3	74.5
Jharkhand	59.6	45.5	46.1	49.1	48.8	56.2
Karnataka	33.4	36.0	25.6	26.8	24.3	36.2
Kerala	45.2	54.2	48.7	51.8	50.2	50.5
Madhya Pradesh	43.8	43.5	46.3	44.6	52.3	52.0
Manipur	26.7	30.9	30.2	49.9	49.4	46.3
Mizoram	62.8	57.9	43.1	44.6	38.0	35.1
Nagaland	53.1	50.7	41.7	42.2	41.7	44.2

Source: Annual Status of Education Report, p.9, 2018.

Economic Survey, Ministry of Finance, Government of India, p.132, 2014-15

<http://www.telegraph.co.uk/news/worldnews/asia/china/8187967/Shanghai-students-ranked-best-in-the-world-at-maths-and-science.html>.

The role played by the quality of education system of the students of Government schools who could read 44.2 percent in 2018. The position of the students of V was in all the states except Andhra Pradesh, and Karnataka, which implemented in 2009-10 reading ability in student

Children who can read

Students of class of	
V	2
Government	5
Private	6

Source: Annual Status of Education Report, p.9, 2018.

Table 1.4 shows a comparison of the position of government schools but one thing that is clear is the decline of reading among the students of private schools that declined to 65.1 percent of the students of primary education. The decline indicates that there are some problems in the education system.

Percentage of children in

India	2008
V	34.4
VIII	65.2

Source: Annual Status of Education Report, p.9, 2018.

Learning level of students and effectiveness of the whole education system.

8 Annual Status of Education Report, p.9, 2018.

The role played by the learning capabilities cannot be denied towards the quality of education system. Table 1.3 shows a decline in the learning ability of the students of Government schools after 2008. In 2008 the V standard children who could study class II book was 53.1 percent which declined to 44.2 percent in 2018. The situation is really deplorable because less than half of the students of V were not able to read the book of standard II. The decline was in all the states except for Tamil Nadu, Gujarat, West Bengal, Uttar Pradesh, and Karnataka. It needs no emphasis that the right to education was implemented in 2009-10 and it was found that there was a decline in the reading ability in students of Government schools thereafter.

Table 1.4
Children who can read a Std.II level text in Government Vs Private Schools

Students of class of V	2008	2010	2012	2014	2016	2018
Government	53.1	50.7	41.7	42.2	41.7	44.2
Private	67.9	64.1	61.2	62.6	63.0	65.1

Source: Annual Status of Education Report, p.10, 2018.

Table 1.4 shows a comparative analysis of Government and private schools. The position of private schools is better than the Government schools but one thing that was common in both the schools is that the calibre of reading among the students of class V was on decline. In 2008 the students of private schools that could read the text of class II was 67.8 percent which declined to 65.1 percent in 2018. It should however be pointed out that 35 percent of the students could not read the text shows the declining quality of primary education. The Planning Commission acknowledged the fact in 2012 that there are some problems in learning outcomes⁸ of the primary education system.

Table 1.5
Percentage of children in Government Schools who can do division (Std. V vs VIII)

India	2008	2010	2012	2014	2016	2018
V	34.4	33.9	20.3	20.7	21.1	22.7
VIII	65.2	67.0	44.5	40.0	40.2	40.0

Source: Annual Status of Education Report, p.11, 2018

Learning level of students of primary education is the indicator of effectiveness of the whole education system. One of the indicators of learning

8 Annual Status of Education Report, p.9, 2018

... is the basic arithmetic skills among the students. There was decline in the arithmetic skills as well, in 2008, 34.4 percent of the students of V and 65.2 percent of students VIII of Government schools were able to perform division which declined to 22.7 percent and 40 percent respectively in 2018.

Table 1.6
Percentage of Children in Private Schools who can do division(Std. V vs VIII)

	2008	2010	2012	2014	2016	2018
India						
V	47.1	44.2	37.8	39.3	38.0	39.8
VIII	71.8	72.0	57.1	54.2	51.2	54.2

Source: Annual Status of Education Report, p.11, 2018.

The position of private schools was somewhat better but still one cannot be satisfied with the situation. In 2008, 47.1 percent of the students of class V and 71.8 percent of standard VIII could perform division which declined to 39.8 percent and 54.2 percent respectively in 2018. Although in some of the years there was some improvement but the status of education could not reach the level as it was in the year 2008. The quality of primary education has a question mark on the education system of India.

Secondary Education

Education plays an important role in the economic development of any economy especially a developing country like India which aims to achieve a double digit growth rate. India is in the process of becoming a member of knowledge economy with great stress on digitalisation⁹, all members of the economy need to be highly informed in order to share the fruits of development. No doubt, India has adopted the universalisation of primary education so that every member of the society should share the fruits of development. The question arises that will mere eight years of primary education be enough to make a knowledge society. In the era of information technology education of eight years is very less to make a member competitive enough to share the fruits of development.

Gross Enrolment Ratio

State	
	2010
Andhra Pradesh	7
Assam	7
Bihar	6
Goa	1
Gujarat	7
Haryana	8
Himachal Pradesh	1
J and K	6
Karnataka	8
Kerala	10
Madhya Pradesh	8
Maharashtra	8
Punjab	8
Rajasthan	7
Tamilnadu	9
Uttar Pradesh	6
West Bengal	7
All India	7

Gross Enrolment ratio includes all children at school level irrespective of age to the total population at school level. Enrolment ratios are based on the data of the Ministry of HRD, as per updated data of access, 30th June, 2010. Source: Secondary Education in India, Ministry of Educational Planning & Administration.

Enrolment is one of the indicators of the inclusiveness of our education system. The 1.7 clearly shows that the enrolment in the year 2010 was 1.7, which is excluded from the education system. In higher secondary education, the globalisation when the enrolment at international level university of formal education is 1.7, which is excluded from the education system.

⁹ <https://www.thehindubusinessline.com/opinion/how-digitalisation-can-drive-growth-in-india/article24174405.ece>, published on June 15, 2018

Table 1.7
Gross Enrolment Ratio of Secondary and Higher Secondary Education

State	Gross Enrolment Ratio			
	Secondary		Higher Secondary	
	Total no. of Enrolment		Total no. of Enrolment	
	2014-15	2015-16	2014-15	2015-16
Andhra Pradesh	72.40	75.51	51.63	60.16
Assam	74.78	77.59	33.97	38.81
Bihar	69.09	78.37	31.79	35.62
Goa	113.63	104.16	77.88	75.84
Gujarat	74.34	74.13	44.93	43.43
Haryana	84.25	84.22	65.78	59.59
Himachal Pradesh	115.87	107.08	100.58	95.53
J and K	66.29	66.81	59.33	58.60
Karnataka	81.80	83.22	32.96	39.86
Kerala	103.24	102.44	76.87	77.56
Madhya Pradesh	80.18	80.49	45.48	45.25
Maharashtra	89.31	89.95	62.20	67.81
Punjab	85.59	87.06	69.39	70.19
Rajasthan	76.16	76.06	56.46	59.31
Tamilnadu	91.89	93.92	77.52	82.03
Uttar Pradesh	67.79	67.75	63.75	60.78
West Bengal	78.17	83.56	49.95	51.54
All India	78.51	80.01	54.21	56.16

Gross Enrolment ratio includes percentage of total number of pupils enrolled at an educational level irrespective of age to the population of the official age group of that educational level.

Enrolment ratios are based on child population provided by department of Higher Education, Ministry of HRD, as per update on (http://mhrd.gov.in/statist?field_statistics_category_tid=163 date of access:30th June, 2016).

Source: Secondary Education in India Progress towards Universalisation, National University of Educational Planning & Administration, p. 67, 2016.

Enrolment is one of the indicators which clearly indicates the inclusiveness of our education system. More people receiving secondary education more are the people sharing fruits of economic development. Table 1.7 clearly shows that 80 percent of the students were receiving secondary education in the year 2015-16 that means 20 percent of the students are excluded from the education system. Out of these only 56.16 percent received higher secondary education. As it is already felt that in the era of globalisation when there is competition not only at national level but also at international level universalisation of only primary education i.e. eight year of formal education is not enough instead it is required that universalisation of formal education should be at least up to the level of higher secondary.

thing that needs to be stressed on is that development has a direct link with provision of secondary education. It is expected that more developed the state better is the position of secondary education but the table clearly shows that Himachal Pradesh which is one of the developed State is providing secondary education in a better way as compared to Goa which is one of the developed States of India. That means only availability of financial resources are not enough for providing a better way rather, the will power of the State is more important.

It needs no emphasis that availability of better infrastructure and adequately trained manpower is one of the need for raising the standard of education. The Table 1.8 shows the percentage of teachers by academic qualification. Teachers' qualification includes formal education, professional development, pedagogical preparation, year of training. Formal education plays an important role towards the knowledge of subject matter. Graduation is a minimum eligibility criteria for a teacher who is supposed to teach secondary section i.e. class IX and X.

The table shows a different fact that in India 6.77 percent of the teachers teaching secondary section were not even graduates. The situation is not only in underdeveloped States but also for the developed States. A developed state like Goa had 0.40 percent teachers having qualification less than graduation and were teaching secondary section the highest among all the states. As was for Karnataka, were 38.20 percent teachers had qualification less than graduation. Not only this there were 2.82 percent teachers teaching secondary whose academic qualification was less than graduation at all India level with 15.68 percent Karnataka is topping the list, Andhra Pradesh's performance was the best because it had no teacher in either TGT (meant for secondary education) or PGT (meant for teaching higher secondary) having qualification less than the standard set in India. The minimum qualification for teaching higher secondary is post-graduation still 19.63 percent of the teachers teaching higher secondary all over India were not graduates while 73.3 percent of the teachers were having the post-graduate degree. That means 19.63 percent of the teachers were having professional qualification less than what is essential for teaching higher secondary.

Percentage of

State	Percentage of	
	Below Graduation	Graduate
Andhra Pradesh	0.00	52.06
Assam	5.30	78.45
Bihar	9.76	31.47
Goa	0.40	61.27
Gujarat	0.35	56.60
Haryana	3.26	29.67
Himachal Pradesh	6.18	35.80
J & K	0.45	40.87
Karnataka	38.20	38.47
Kerala	5.02	56.87
Madhya Pradesh	1.68	38.77
Maharashtra	10.55	62.77
Odisha	11.89	68.67
Punjab	4.92	33.77
Rajasthan	4.45	48.67
Tamil Nadu	2.69	34.97
Uttar Pradesh	0.75	29.67
West Bengal	1.29	37.77
All India	6.77	45.47

Source: Secondary Education in India, Ministry of Educational Planning & Administration.

Building, classroom infrastructure play a significant role. It is expected that a high quality infrastructure improves student's output by computer and libraries.

Table: 1.8
Percentage of Teachers by Academic Qualification in 2015-16

State	Percentage of Teachers by Academic Qualification									
	Secondary					Higher Secondary				
	Below Graduation	Graduate	Post Graduate	M. Phil	Ph.D/Post Doctoral	Below Graduation	Graduate	Post Graduate	M. Phil	P.hd/Post Doctoral
Andhra Pradesh	0.00	52.06	46.45	1.16	0.33	0.00	14.64	81.43	2.94	0.99
Assam	5.30	78.45	15.56	0.36	0.33	1.25	10.68	79.18	7.38	1.50
Bihar	9.76	31.41	53.73	0.67	2.91	3.67	7.40	70.02	2.00	6.22
Goa	0.40	61.21	37.71	0.42	0.26	2.35	14.50	80.80	1.28	1.07
Gujarat	0.35	56.60	41.79	0.68	0.58	0.31	31.20	66.02	1.63	0.84
Haryana	3.26	29.62	60.55	4.93	1.64	0.69	12.39	75.07	8.85	3.30
Himachal Pradesh	6.18	35.86	54.27	3.23	0.45	1.93	12.32	77.19	7.68	0.88
J & K	0.45	40.85	56.63	2.05	0.02	0.05	12.21	81.25	6.31	0.18
Karnataka	38.20	38.43	20.02	1.72	1.45	15.68	11.37	66.43	3.79	1.49
Kerala	5.02	56.84	36.55	0.85	0.73	1.90	13.75	80.31	3.27	0.76
Madhya Pradesh	1.68	38.71	58.33	0.64	0.64	1.12	19.41	77.13	1.12	1.22
Maharashtra	10.55	62.75	26.21	0.29	0.19	9.20	17.84	70.68	1.50	0.78
Odisha	11.89	68.64	18.66	0.53	0.23	2.24	9.81	78.58	5.53	1.92
Punjab	4.92	33.75	58.84	2.04	0.45	2.60	17.41	73.64	5.44	0.90
Rajasthan	4.45	48.67	46.20	0.44	0.24	3.49	35.98	59.48	0.57	0.47
Tamil Nadu	2.69	34.99	50.89	10.99	0.43	1.67	13.44	59.33	24.87	0.70
Uttar Pradesh	0.75	29.63	67.45	0.64	1.37	0.88	22.89	73.09	0.91	2.15
West Bengal	1.29	37.74	59.25	1.21	0.44	1.43	26.05	70.28	1.50	0.69
All India	6.77	45.40	45.13	1.87	0.73	2.82	16.81	73.13	5.44	1.36

Source: Secondary Education in India Progress towards Universalisation, National University of Educational Planning & Administration, p. 41, 2016.

Building, classrooms, laboratories and equipment i.e. educational infrastructure play a significant role in building learning environment. It is expected that a high quality infrastructure facilitates better instruction and improves student's outcome and reduces dropout rates. Today the role played by computer and libraries cannot be under emphasized.

Table: 1.9

Stage of Schools having facilities of Computer with Internet, Library and Librarian

	Percentage Schools with Computer and Internet		Percentage Schools with Librarian		Percentage Schools with Library	
	2014-15	2015-16	2014-15	2015-16	2014-15	2015-16
Andhra Pradesh	33.41	37.13	9.37	47.15	93.66	94.18
Assam	8.47	11.28	6.45	8.86	65.74	67.94
Bihar	10.41	10.92	25.65	31.93	89.20	89.29
Chhattisgarh	90.35	93.13	18.48	21.41	99.38	99.80
Goa	62.81	64.85	15.90	20.01	84.42	86.36
Gujarat	61.08	63.62	14.53	16.30	98.81	98.85
Haryana	49.11	52.35	19.84	20.76	99.26	99.10
Himachal Pradesh	18.03	19.59	12.43	16.78	88.16	89.01
Jammu & Kashmir	17.34	18.50	10.08	11.48	89.83	90.89
Jharkhand	28.83	30.73	12.40	14.82	97.29	97.51
Karnataka	92.16	92.93	24.95	26.55	98.99	99.06
Kerala	15.81	33.98	14.27	15.62	90.02	92.25
Madhya Pradesh	56.44	60.20	18.46	19.68	97.59	97.43
Maharashtra	81.24	84.42	17.49	20.66	97.72	98.27
Odisha	31.37	36.00	21.35	22.86	89.10	89.98
Punjab	78.69	79.70	9.40	13.84	99.06	99.38
Rajasthan	16.53	17.16	27.71	28.36	77.67	77.50
Tamil Nadu	34.27	39.09	21.27	63.75	92.63	93.64
Uttar Pradesh	36.64	40.05	16.53	20.70	90.17	90.68
Uttarakhand						
West Bengal						
All India						

Secondary Education in India Progress towards Universalisation, National University Educational Planning & Administration, p. 22, 15, 14, 2016.

Table 1.9 shows the position of availability of computer with internet and library in secondary education in Indian States. The secondary schools with computer facilities stood at 36.4 percent in 2014-15 which showed a slight improvement by 3.41 points in 2015-16. In the stage of development which relies on information technology only 40 percent of the schools have the facilities of computer, that means students studying in 60 percent schools are not having facilities for computer and are not in the position to make the best use of the facilities available. It should be strong enough to participate in the job market equally. It should

however be pointed out that the number of libraries of which only 2 means only 70 percent of the schools provide the facility of library to the students.

Transition Rate of

State	Transition Rate of
Andhra Pradesh	
Assam	
Bihar	
Goa	
Tamil Nadu	
Haryana	
Himachal Pradesh	
Jammu & Kashmir	
Jharkhand	
Karnataka	
Kerala	
Madhya Pradesh	
Maharashtra	
Punjab	
Rajasthan	
Tamil Nadu	
Uttar Pradesh	
Uttarakhand	
West Bengal	
All India	

*Calculated on the basis of the first grade of an

Educational level, expressed as

Source: Secondary Education in India Progress towards Universalisation, National University Educational Planning & Administration, p. 22, 15, 14, 2016.

The table 1.10 shows the percentage of students studying in secondary schools in 2013-14 which declined from 69.04 percent in 2012-13 to 69.04 percent in 2013-14. The rate of secondary to higher secondary has increased to 69.04 percent in 2013-14. It should be pointed out that the students are not in the position to make the best use of the facilities available.

however be pointed out that only 90.68 percent of the secondary schools have libraries of which only 20 percent of the school library has a librarian. That means only 70 percent of the above mentioned schools are in the position to provide the facility of library in the true sense for capacity building of its students.

Table 1.10
Transition Rate of Indian Schools from Elementary to Higher Secondary

State	Transition Rate*			
	Elementary to Secondary		Secondary to Higher Secondary	
	2013-14	2014-15	2013-14	2014-15
Andhra Pradesh	96.21	94.44	76.38	71.74
Assam	83.82	87.43	46.90	55.79
Bihar	90.80	84.64	44.35	44.07
Goa	-	-	97.54	94.26
Tamil Nadu	85.16	84.21	62.74	57.26
Haryana	94.27	92.90	76.08	69.64
Himachal Pradesh	97.58	97.57	77.35	83.49
Jammu & Kashmir	88.18	87.45	93.38	81.99
Jharkhand	79.86	79.20	59.35	57.82
Karnataka	94.25	92.09	45.72	52.01
Kerala	-	99.81	73.34	75.85
Madhya Pradesh	78.83	81.48	56.60	57.47
Maharashtra	-	98.72	80.81	85.24
Punjab	93.43	93.63	86.33	83.44
Rajasthan	90.62	94.90	64.44	74.34
Tamil Nadu	89.46	96.67	79.81	85.05
Uttar Pradesh	93.82	88.85	80.45	74.48
Uttarakhand	95.22	94.10	75.32	75.09
West Bengal	92.58	92.02	75.35	75.09
All India	91.58	90.62	67.70	69.04

*Calculated on the basis of new entrants (enrolment adjusted with repeaters) admitted to the first grade of an

Educational level, expressed as percentage of enrolment in a final grade of lower level.

Source: Secondary Education in India Progress towards Universalisation, National University of Educational Planning & Administration, p. 56, 2016.

The table 1.10 shows the transition rate of Indian school system 91.58 percent of students studying in elementary school reached secondary school in 2013-14 which declined to 90.62 percent in 2014-15 while the transition rate of secondary to higher secondary was 67.70 percent in 2013-14 which increased to 69.04 in 2014-15. That means more than 30 percent of the students are not in the position to share the fruits of development.

Higher Education

Development of any economy depends on the higher education. Higher education helps the economy to grow because it comprises of youth within age group of 18-23 years. It helps to shape the economy by giving a new direction to its human resource. It means that employment and higher education are interrelated. It helps in fostering general employability and professional aptitude which helps the youth to earn livelihood with optimum capacity. Therefore, every economy should try to provide higher education to each and every individual so that everyone will have equal opportunity to participate in the labour market as a supplier. The gross enrolment of higher education plays a very important role in determining the quality of supply of labour in the market. Table 1.11 shows the gross enrolment in higher education. The gross enrolment in higher education in 2002 was 4.2 percent which increased to 6.6 percent in 2005-06. It further increased to 11.2 percent in 2005-10. Finally, in the year 2015-16 the gross enrolment increased to 14.2 percent. No doubt, there is increase in enrolment but the increase is not satisfactory because more than 85 percent of the people are not having equal opportunity to participate in the labour market.

The situation of female labourers is more deplorable as compared to the male counterparts. In none of the years there was gender parity in higher education in the matter of gross enrolment. Only 12.9 percent of female got enrolled in higher education. That means 87 percent of the female did not have the opportunity to participate in labour market equally.

Table 1.12
Gross Enrolment in Higher Education

	Male	Female	Total
2002	5.8	2.6	4.2
2003	5.6	2.4	4.0
2004	6.2	3.1	4.7
2005	6.3	3.5	4.9
2006	8.6	4.7	6.6
2007	9.5	5.5	7.5
2008	12.4	6.7	9.5
2009	11.6	6.70	9.2
2010	13.1	7.5	10.3
2011	12.9	9.5	11.2
2012	12.4	9.7	11.0
2013*	12.4	9.8	11.1

2013-14*	
2014-15*	
2015-16*	

*Figures are provisional

Source: Educational Statistics
Development Department of
Delhi, p.30, 2018

Any labour market in a global economic environment further help themselves. New skills are needed to develop new technology and on

Both these are the two and more technical graduates and professionals instead of discipline wise detail maximum number of graduates which has declined to 4 percent in Commerce graduates from 17.73 percent in Agriculture which is the population the students 17.73 percent of the total enrolment knowledge which lays the system of rules for the theoretical aspect of science- and technical emphasized. The demand nationally and internationally than only art graduates. a cause of concern. No youth lacking skills the Programme for providing remains that the Arts graduates skills so that they could crowd for post-graduate

2013-14*	12.5	10.2	11.3
2014-15*	15.2	12.3	13.7
2015-16*	15.6	12.9	14.2

*Figures are provisional

Source: Educational Statistics at Glance, Government of India, Ministry of Human Resource Development Department of School Education and Literacy, Statistics Division, New Delhi, p.30, 2018

Any labour market needs graduates who are innovative enough to suit the global economic environment and are able to exploit opportunities and further help themselves to flourish. Its needs no emphasis that diversity of skills are needed to develop an economy full fledgedly on one hand we need new technology and on the other hand innovative approach is required.

Both these are the two sides of the same coin, our economy require more and more technical graduates (in view of digitalisation of the economy) , professionals instead of producing more Arts graduates. Table 1.13 shows the discipline wise detail of enrolment in higher education. India produces maximum number of graduates in humanities it was 46.51 percent in 2010-11 which has declined to 40.08 percent in 2015-16. The engineering graduates formed 17.73 percent in 2010-11 which declined to 15.57 percent in 2015-16. Commerce graduates formed 14.14 percent, IT and Computers were 2.50 percent while medical stood at 3.30 percent of the total enrolment. Agriculture which is the major source of living for more than half of the population the students who enrolled for agriculture science formed 0.67 percent of the total enrolment. It needs no emphasis that art is a systemised knowledge which lays down specific solution to specific problems. An art is the system of rules for achieving a certain end¹⁰. Science merely discusses the theoretical aspect while art stresses on the practical aspect. Still the role of science- and technology towards the development cannot be under emphasized. The demand for Indian labour is likely to increase both nationally and internationally. But this demand is for skilled labour rather than only art graduates. The employability among Indian youth now a days is a cause of concern. No doubt, Indian Government is concerned about the youth lacking skills therefore Indian Government has started the Skill India Programme for providing training to the demographic dividend. Still the fact remains that the Arts graduates should also be provided with employability skills so that they could earn their livelihood on one hand and on the other the crowd for post-graduation and Ph. D programmes could be reduced.

10 Keynes, J.N, Scope and Method of Political Economy, p. 46, 1891.

Table 1.13

Percentage Enrolment in different Disciplines/Subjects at Under Graduate level in Higher Education

Discipline	% Enrolment			
	2010-11	2012-13	2014-15	2015-16
Humanities/Social Sciences	46.61	40.69	40.24	40.08
Engineering & Technology	17.73	16.34	15.89	15.57
Science	13.54	14.53	13.98	14.14
Commerce	10.85	12.60	15.38	16.04
Computer	2.97**	4.11	2.57	2.50
Physical Science	2.79	2.87	3.05	3.30
Management	2.51	2.19	1.93	1.91
Mathematics	0.95	0.95	1.13	1.20
Arts	0.61*	0.55	0.61	0.67
Education	NA	3.10	3.25	2.61
Distance Learning	NA	0.46	0.39	0.37
Other allied discipline also.	1.45	1.60	1.58	1.62

*Other allied discipline also.

**Includes only computer and computer science

Source: Educational Statistics at a glance, Government of India, Ministry of Human Resource Development, Bureau of Planning, Monitoring & Statistics, New Delhi (2013-2014).

Source: Educational Statistics at a glance, Government of India, Ministry of Human Resource Development, Department of School Education & Literacy Statistics Division, New Delhi (2018) (website: <http://mhrd.gov.in/statist>, www.aishe.gov.in)

Table 1.14

Public Expenditure on Education and GDP

	GDP at current price at factor cost (Rs crores)	Total expenditure on education by education and other departments (Rs crores)	Expenditure on education by education and other departments as percentage of GDP (percent)
2004-05	10080	64.46	0.64
2005-06	16620	239.55	1.48
2006-07	42222	892.36	2.11
2007-08	130178	3884.80	2.98
2008-09	510964	19615.85	3.84
2009-10	1991982	82486.82	4.14
2010-11	3390503	113228.71	3.34
2011-12	7248860	293478.23	4.05
2012-13	9946636	368132.87	3.87
2013-14*	11236635	433640.59	3.86
2014-15*	12433749	502929.34	4.04

*Year has been revised from 2004-05 to 2011-12

Source: Educational Statistics at a glance, Government of India, Ministry of Human Resource Development, Department of School Education & Literacy Statistics Division, New Delhi, 2018

It needs no emphasis on the key role towards economic growth. The need for investment in education for restructuring therefore arises initially which will attract

Table 1.14 shows the proportion of total expenditure on secondary and tertiary education stood at 0.64 percent of GDP in the year in which started. It rose to 3.84 percent which in 2010-11 stood at 4.05 percent in 2010-11. It further declined to 3.87 percent in 2014-15. It should be the responsibility of the government towards providing opportunity should not be regarded as good¹¹ and provided b

Analysis of the S

Development of a human resource development in that economy. It is employment depends on the fact the educational standard level. The paper found

The gross enrolment ratio is 100 percent but the GER is 73.4 percent. It declined to 73.4 percent in primary education is 73.4 percent. It showed a declining trend of standard V-VIII. It is 73.4 percent in 2018 in Ge

The GER in high school of secondary education study found that acca

11 <https://www.ezyeducation.com/merit-goods.html>

It needs no emphasis that education, especially tertiary education plays a key role towards economic growth of country. The improvement of education needs investment. The public expenditure on education is an important part of investment in education. Since the tertiary education system needs total restructuring therefore the pathway has to be made by the Government initially which will attract private investment afterwards.

Table 1.14 shows the education expenditure as a percentage of G.D.P. The proportion of total expenditure on education (including primary, secondary and tertiary education) as percentage of G.D.P in the year 1951-52 stood at 0.64 percent which increased to 2.11 percent in 1971-72. In 1990-91, the year in which structural reforms were introduced in India the share was 3.84 percent which increased to 4.14 percent in 2000-01 which declined to 4.05 percent in 2010-11 which further declined to 3.87 percent in 2012-13. It further declined to 3.86 percent but there was a slight improvement of 0.18 points in 2014-15. No doubt education is a private good, theoretically it should be the responsibility of the private sector but it plays a significant role towards providing opportunity to compete in the labour market therefore it should not be regarded as a private good rather it should be taken as a merit good¹¹ and provided by the State.

III

Analysis of the Study

Development of an economy depends upon the human resource. In turn human resource development depends upon standard of education and health in that economy. It needs no emphasis that in a globalised society employment depends upon the level of technical knowledge. In view of this fact the educational strategy needs to be planned from the primary to tertiary level. The paper found following facts about the Indian educational system.

The gross enrolment ratio (GER) in primary education was above 100 percent but the GER of girls was less as compared to boys from class I to V. It declined to 73.4 percent for VI-VIII. The other indicator of quality of primary education is the problem solving capacity among the students, showed a declining trend. It was found that in 2008, 65.8 percent of students of standard V-VIII were able to perform division which declined to 40 percent in 2018 in Government schools.

The GER in higher secondary was 56.16 percent in 2015-16. The quality of secondary education depends upon the infrastructure and teachers. The study found that academic qualification of 2.82 percent of the teachers in

11 <https://www.ezyeducation.co.uk/ezyeconomicdetails/ezylexicon-economic-glossary/750-merit-goods.html>

secondary education was less than graduation while 16.81 percent were graduates were as 73.13 percent were post graduates. That means that almost percent of the teachers were under qualified for teaching higher secondary. A day's computer and library are the two most important components of secondary education in terms of infrastructure. In 2015-16, 59.35 percent of schools did not had computers while 9.32 percent were not having library on their premises.

The GER in higher education was 14.2 percent of which male GER stood at 15.6 percent and female at 12.9 percent. The enrolment in higher education is found too low for making India a knowledge economy. The participation of women in higher education is lesser as compared to males which makes India less competitive in the factor market. Participation in labour market in a globalised economy depends upon the skilled man power. In India 40.8 percent of the students took humanities as their area of interest 15.58 percent for engineering, only 3.30 percent pursued medical and 0.67 percent agriculture.

The paper on a whole found that there is gender diversity in the education system of India from primary to tertiary. The system lacks sufficient infrastructure for linking it with the labour market. The only way to sort out the problem is by the efforts of the Government. Although the government has taken steps to encourage education like primary education, free books and uniforms to the students, scholarship for girl students, free loans to IIT students etc.. The public expenditure on education is 10.04 percent of GDP in 2014-15 which needs to be expanded to sort out the problems mentioned above.

Recommendations of the Study

Education as consumption and investment is one of the fundamental factors that effect economic development. No country can grow sustainably without significant investment in human capital. A good and productive workforce by making use of the available resources can lead an economy to prosperity. One of the important measure that leads to development of the human capital is education. Investment on education makes the process of development sustainable forever. It enriches one's productivity and encourages entrepreneurship and technological advancement. The process of development is a complex mixture of financial and human capital. The countries which were able to invest on them in correct proportions are now developed and those are who are not in the position to achieve this equilibrium are underdeveloped. It has been very rightly felt by Adam Smith that the acquired skills by all inhabitants are a kind of capital¹² now the same is

termed as human capital externality for development.

The contemporary view of the world is now known as globalisation of trade and technology. It can make the world more advanced by technological evolution and reduction but also for it it can bring about economic growth on one hand and on the other to adapt with the changing world more smoother the economic growth. The retraining of the people should provide new skill to the people should however be provided in the formal sector¹³. The Human Development Index (HDI) has said most of the people in the world are illiterate. The factor that contribute to education and training is very essential to create an increasing productivity, skill programme, school and workforce¹⁵. There is a need for quality depends on the quality means without quality higher education which is not in the market. The enrolment in primary education show meaning for quality of primary education show approximately 100 percent of the V student percent of the student are some of the indicators deteriorating. It needs which the quality of sc

13 Timor-Leste, National Human Development Report

14 <https://www.project-syndicate.org/stiglitz-2016-08>

15 Naushad Forbes, "It's a 2019.

termed as human capital. Development of human capital acts as a positive externality for development of any country.

The contemporary world is dominated by the philosophy of globalisation. The world is now knitted into one piece of land and one cannot stop globalisation of trade and economies on one hand and on the other, forces to make the world more and more competitive. The competitive world is fuelled by technological evolutions that give birth to innovativeness not only for cost reduction but also for one's survival. The effect of globalisation has two folds it can bring about economic prosperity for those who have well adapted with it on one hand and on the other there can be losers who are not in the position to adapt with the changes made. In order to make this process of transition more smoother the economy should provide more and more opportunities for retraining of the people who are displaced due to technological changes and provide new skill to the people which suits the demand of labour market. It should however be pointed out that India is suffering from lack of jobs in formal sector¹³. The position of job seekers is problematic everywhere (Human Development Report, 2018, P. 12). Joseph Stiglitz (2012) has rightly said most of the people are not able to reap the benefits of globalisation¹⁴. The factor that contribute to this are low skilled labour, lack of quality education and training which are needed by the labour market. Therefore, it is essential to create millions of high quality jobs with the potential of increasing productivity. It needs high quality talent by improving various skill programme, school education quality and female participation in the workforce¹⁵. There is no denying of the fact that the quality of education depends on the quality of primary, secondary and tertiary education. That means without quality of primary education one cannot expect a strong higher education which is directly related to supply of labour in the factor market. The enrolment and quality at primary education level makes a great meaning for quality of secondary and higher education. The enrolment at primary education shows a very impressive picture because the enrolment is approximately 100 percent. The other factor i.e. quality, matters a lot, 44.2 percent of the V students were not able to read the text of class II and 40 percent of the student of class VIII were not able to perform division. These are some of the indicators which show that the quality of primary education is deteriorating. It needs no emphasis that primary education is the base on which the quality of secondary and tertiary education depends. Better the

13 Timor-Leste, National Human Development Report, UNDP, 2018.

14 <https://www.project-syndicate.org/commentary/globalization-new-discontents-by-joseph-e--stiglitz-2016-08>

15 Naushad Forbes, "It's about jobs in industry", Business Report, Monday, 29 April, p.7, 2019.

quality of primary education better will be quality of secondary and tertiary higher education. One of the need of better quality education is the connection of education to innovation and growth which ultimately leads to self-employment. There is no denying of the fact that the private sector is not in the position to increase employment in the proportion of increasing labour therefore, there is a need to encourage self-employment. In order to increase the sources of employment not only educated people but also more and more research laboratories are needed as both are the keys to development. The role of the Government should be to unbalance¹⁶ the economy by providing a better infrastructure towards education rather than providing various source of employment the other sector i.e. private sector will themselves create the modes of employment. Efficient spending is one of the important factor for not only labour but also the factor productivity¹⁷ (St. John, 2009). It should however be pointed out that the link between public spending on education leads to productivity of not only new members of the labour market but also the efficiency of the older members of the labour market. Efficient spending by the Government ultimately leads to employability. The employability of graduates increases in the education system where higher education is efficient¹⁸. In the era of globalisation where the whole world has become the member of knowledge society teaching anything irrelevant pushes the member out of the knowledge society. It is very important to make the education system adopt an innovative approach from primary to higher education to cater the needs of a globalised society. The other need is to improve the quality of higher education not only by improvement in infrastructure but also improvement in quality of primary and secondary education. There is a need to focus more on the graduate students in India and give them education that can give them job in order to sort out the problem of unemployment and also reduce the pressure on post graduate and doctoral education. In order to do the same it is necessary to give skill oriented education to the students of graduation especially to the Art students. There is a need to not only restructure higher education but also the whole education system. A multidisciplinary approach¹⁹ needs to be

adopted at higher education to knowledge of their student to opt any science to go for any art subject on decline therefore a mathematics up to the receive skill education able to cope up with broader national interest the Government so that making profession. No need bold changes within private sector. Therefor a public good which is holistic picture of education policy rather than a picture of employment in India taken into consideration secondary education should

- 16 Hirschman, A. O. "The Strategy of Economic Development", Chapter 4-7, also see Jhingan, M.L., "The Economics of Economic Development and Planning", p.189, 1997
- 17 European Economy: Efficiency and Effectiveness of Public Expenditure on Tertiary Education in the EU, Joint report by the Economic Policy Committee (Quality of Public Finances) and Directorate-General for Economic and Financial Affairs, Belgium, P. 10, October, 2010.
- 18 European Economy : Efficiency and Effectiveness of Public Expenditure on Tertiary Education in E.U, joint report by Economic Policy Committee and Directorate General for Economic and Financial Affairs, P. 8, October, 2010.
- 19 Younis Ahemad Shekh, Higher Education: Challenges and Opportunities, Journal of Education and Practice, Vol.8, No.1, p.42, 2017

Annual Status of Education
Economic Survey, Ministry
Educational Statistics at a
Development, Department
Delhi.

Eleventh Five year plan, Plan
European Economy: Efficiency
in the EU, Joint report
and Directorate General

Hirschman, A.O. "The Strategy
M.L., "The Economics of
<https://www.ezyeducation.com/goods.html>

<https://www.thehindubusinessline.com/article/24174405>

<https://www.telegraph.co.uk/best-in-the-world-at-m>

<https://en.wikipedia.org/wiki/stiglitz-2016-08>

Keynes, J.N. Scope and Method
Naushad Forbes, "It's about
NSSO, 55th round. Report
Government of India.

adopted at higher education level so that they (students) will not be restricted to knowledge of their own subject. There should be provision for the Art student to opt any science subject and the science students should be allowed to go for any art subject. The mathematical calibre of the Indian students is on decline therefore all the students should be given the knowledge of mathematics up to the level of intermediate so that they will be prepared to receive skill education at graduation level. After graduation students will be able to cope up with challenges of labour market. Therefore, it is in the broader national interest that the higher education institutes be financed by the Government so that this noble profession may not become a money making profession. Not only this will the restructuring of education system need bold changes which will be almost not possible to be undertaken by the private sector. Therefore, in view of the merit of education, it should be made a public good which should be provided by the Government only. Secondly, holistic picture of education should be taken into account before making any policy rather than a piecemeal approach i.e. in order to improve the position of employment in India the quality of not only higher education should be taken into consideration but also compulsory and high quality primary and secondary education should be give equal importance.

References

- Annual Status of Education Report, p.9, 2018.
- Economic Survey, Ministry of Finance, Government of India.
- Educational Statistics at a glance, Government of India, Ministry of Human Resource Development, Department of School Education & Literacy Statistics Division, New Delhi.
- Eleventh Five year plan, Planning Commission, Government of India, 2007-12.
- European Economy: Efficiency and Effectiveness of Public Expenditure on Tertiary Education in the EU, Joint report by the Economic Policy Committee (Quality of Public Finances) and Directorate-General for Economic and Financial Affairs, Belgium, October, 2010.
- Hirschman, A.O. "The Strategy of Economic Development", Chapter 4-7, also see Jhingan M.L, "The Economics of Economic Development and Planning", 1997.
- <https://www.ezyeducation.co.uk/ezyeconomicdetails/ezylexicon-economic-glossary/750-merit-goods.html>
- <https://www.thehindubusinessline.com/opinion/how-digitisation-can-drive-growth-in-india/article24174405.ece>
- <https://www.telegraph.co.uk/news/worldnews/asia/china/8187967/Shanghai-students-ranked-best-in-the-world-at-maths-and-science.html>
- <https://en.wikipedia.org/wiki/Human-capital>
- <https://www.project-syndicate.org/commentary/globalization-new-discontents-by-joseph-e--stiglitz-2016-08>
- Keynes, J.N, Scope and Method of Political Economy, 1891.
- Naushad Forbes, "It's about jobs in industry", Business Report, Monday, 29 April, p.7, 2019
- NSSO, 55th round, Report No. 473, Ministry of Statistics & Programme Implementation, Government of India.

- Secondary Education in India Progress towards Universalisation, National University of Educational Planning & Administration.
- Ministry of India, New Delhi, July 25, 2007.
- United Nations Development Programme, UNDP, 2018.
- UNDP Human Development Report, New York, 1996.
- UNDP ILO (2007): Asian Experience on Growth, Employment and Poverty; An Overview with special Reference to the findings of some recent studies, Colombo, UNDP/Geneva, ILO.
- World Bank: India: Inclusive Growth And Service Delivery: Building on India's Success-Development Policy Review, Report No.34580-IN, Washington DC.
- Dr. Ahmad Shekh, Higher Education: Challenges and Opportunities, Journal of Education and Practice, Vol.8, No.1, p.42, 2017.

*Climate Justice and
Kareem, Rameshwar T
Publishing Corporation*

The book under review is titled *Global Environment: Costs and Benefits from a Sophisticated Numerical Fundament Uncertainty*. It presents a brief outline of climate policy, trading and its implications for policy for future generations & development.

Second chapter focuses on the reaction to quantum mechanics "Universe", yet mankind's multitude of interventions on GHG or ozone-depleting substances such as deforestation, etc., even while creating trade.

Climate has emerged as a major issue about Greenhouse effect and its potential for future climate change with how climate change will affect different groups.

The climatologists of the 21st century that the accumulation of greenhouse gases leading to global warming changes. The difficulty is to achieve a "good", meaning that no one is left out if the benefits from its actions. However, such policies are designated environmental decision makers looking for ways to conquer climate change.

Chapter 3 deals with climate change. Nic...

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Land Acquisition: A Source of Welfare or Inequality

Abstract

Land acquisition is a process of taking over of land by the Government for the sake of development of the economy. The land is taken for construction of roads, dams, hospitals and other infrastructural activities. The land is taken from the land owner who sometimes receive partial or sometimes no returns from the project. Therefore, the land owners are reluctant to lose that land which they inherited from their forefathers. On one side the initiative taken by the Government is important for development of the economy but on the other side the land losers sometimes lose their source of livelihood and lead a deplorable life. Therefore, an intermediate path is to be made for not only undertaking developmental initiatives but also satisfying the people from whom land is taken for the same. This paper is an attempt to link the development with social justice to the land owners

Keywords: Infrastructure, Development, Land losers and Social Justice

Introduction

Various revolutions have revived debate around land control, the spread of Imperialism, the rise of nation state and nationalism, the invention and innovation and ultimately victory of globalisation, socialisation and privatization etc. The right of rulers on land is one of important event in history. Even in democracy there is friction on collective rights vs individual land right. Land acquisition means taking over of land by State for infrastructural or other developmental initiatives and in return provide compensation to the affected landowners. Infrastructural developments have a long gestation period. In long run the growth dividends from infrastructure and industry is likely to be materialised and therefore acquisition of land remains one of the main challenges to development¹. It is not only the problem of India but also of many countries of the world. Households are reluctant to give their owned land for the purpose of infrastructural and industrial development because an optimum compensation does not guarantee any fluctuation in long term. Therefore, risk associated with individual contribution towards industrialisation, infrastructural development and change in ownership remains very high. Apart from economic consideration people attach significant social and cultural values to their land². It needs no emphasis that tribal societies have sacred relationship with land, water and forest, the economic formula fails to measure these feelings and hence the compensation given does not satisfy the land owners. The local mythologies and rituals are deeply connected to land and its attributes. In countries that allow private ownership, compulsory land acquisition is a right and action of the Government to take the property not owned by it for public purposes.³ In United States it is known as Eminent Domain, in Canada and Australia the right and action is known as expropriation and compulsory acquisition or resumption⁴.

It should however be pointed out that development is a discontinuous and spontaneous change in the stationary state which for ever alters the equilibrium state previously existing⁵. Many years back when many less developed countries of the world got released from the shackles of colonial bondage the economist realised that the problem with which they were struggling was lack of capital. It was felt by Lewis⁶ that development is a transfer of low productive agricultural labour to highly productive industrial areas. The literature that emerged with Lewis lays emphasis on dualism i.e. equal importance to agriculture and industry in order to maintain stable terms of trade between agriculture and industry for an unhindered capital formation in industrial sector. In mid 1980s⁷ the emphasis changed from physical capital to human capital and led to endogenous growth model. Lucas⁸ emphasized on endogenous growth model for development according to him long term growth depends upon investment on education and human capital formation. However, neither of the two school of thoughts one emphasizing on physical capital and the



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other on human capital had imagined that a new factor namely land could ever become a constraint to the process of development. The underlying assumption behind it was that land requirement is very less for industry and therefore one can very easily ignore it or one of the other reasons could be that availability of land was not less at that point of time. At the macroeconomic level this was justified, If we look at the land requirement in physical terms for building up industries, services and infrastructure like roads, townships, airports or bridges the total requirement is lesser as compared to agriculture. However, there is a very serious micro economic problem when the land is taken for the above mentioned reasons. It invariably leads to eviction of some people from their original source of livelihood and surroundings. It needs no emphasis that India faces serious challenges in the way to development, sorting out the same will not only generate the pace of development but also become socially inclusive, ecologically sustainable, politically feasible and in accordance with rule of law. Efficient and equitable acquisition of land by State for development projects including infrastructure and industry lies in the heart of these challenges. In order to achieve a high and sustainable growth there has been a substantial step up of investment in infrastructure mostly on transportation, energy, communication, housing, sanitation etc. Enhanced infrastructure sector will certainly help in creating jobs both directly and indirectly. Working paper of Asian Development Bank reveals that 8.8 percent of the GDP is needed to finance infrastructure related projects in south Asia, around 4.5 trillion US dollar worth of investment in infrastructure is required by India till 2040 to improve economic growth and wellbeing.

In order to expedite the process of development more and more land is required.

Most of the appropriate land belongs to either the farmers or the tribes' who have inherited it. Land is the most important and sometimes the only asset they have for their livelihood. Further with the increase in population and reduction of employment avenues the stress on land has increased. This brings to a situation where the non-agricultural sector wants to own more of it but the farmers are not ready to part with it. It leads to the most violent disputes for the developing countries. The problem is not only of India but all the developing countries even the developed countries like US, England etc. had to face it when they were in the process of development. Acquisition of private land by the government for public purposes is a common practice globally. The sharp rise in demand of land started in India with the commencement of planning era. The development started mostly in public sector and requirement of land rose to a great extent. In the initial phase the pressure of population was low. There was little activism on the part of the farmers with hardly any help from the civil society, the legal system was quite conducive for taking over the appropriate land. The empirical studies prove that both the public and the private sector acquired land in plenty. Thus, the land was acquired for building BhakraNangal dam, Bokaro steel

plant, the Telco and Tisco factories, Bajaj scooters. People were evacuated very easily and hardly any compensation was paid to them⁹. No doubt, agitation took place but it were local in nature and were crashed. In the second phase the role of civil society increased the other change that occurred was that the pressure of population on land increased the size of land holdings became small. Secondly, the farmers became more organised and were willing to fight for their rights, in this move they being assisted by NGOs, media and opposition parties.

It needs no emphasis that widespread agitations by the farmers throughout the country shows their level of dissatisfaction with the package of compensation being offered to them. It does not mean that the farmers are not willing to sell their land. It has been empirically proven that 40 percent of the farmers do not want to get engaged in farming¹⁰. All that is if proper compensation is being offered then they can sell their land peacefully. According to Chayanov¹¹ a Russian anthropologist the farmer looks on his family requirements both in short and long run. Their primary focus is on the survival of their family in present and future. The point that should be noticed is that he does not want a luxurious life but he wants his food assured.

At one level no compensation is sufficient when displacement takes place because it is not only loss of a place but also loss of way of living. People change their life style for better. In this the farmers like to shift from low income certainty to high income uncertainty. It is because in last few years seemingly higher amount is being offered to the farmers from many lakhs to even crores of Rupees (for example in Punjab and Haryana). Studies have found that farmers spend these amount on construction of houses or on daughters' wedding without thinking about their future financial requirements. The lump sum amount received does not form the future income of the individual, it is exhausted in his day to day requirement. Here the NGOs come to the rescue of the individual farmer. One distinct feature of the process is that the attachment to land is more in relatively under developed States as compared to the developed ones. People from relatively developed States like Punjab, Haryana and Gujarat are ready to offer their land against sufficient compensation and remain ready to agitate for what they think is their due. In backward areas like Orissa people are reluctant to sell their land but it is seen that it is easier to bulldoze them even by giving them lower financial package¹².

It is thus clear that land becomes the most valuable asset in India and not only a means of livelihood but also a great sign of social power, pride, status, and happiness. Significantly, owning a vast area of land bears testimony to a person's great wealth. Most families are tied to their ancestral land, which is very much a psychological bond, and the feelings and emotions they experience with the ownership of their land can never be compensated for through any means if they lose it. On the other hand development policy focuses on creation of economic opportunities which increase the demand for

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transferring land from primary to secondary or tertiary activities. Market mechanism is sufficient argument of distributive justice for land acquisition for development activities, but it ignores income security. Landowners are heterogeneous in terms of knowledge, skills, risk preferences, attitudes and perception of future development benefits.¹³ The relationship between farming skills and land cannot be separated and becomes a concern for the farmer regarding his financial security and time preference. These concerns exhibited considerable diversity with corresponding preferences over alternative forms of non-cash compensation. Hence, alternative compensation packages ought to be offered to cater to this diversity¹⁴.

Conclusion

It needs no emphasis that development is the foremost requirement of any community since time immemorial. Development is a kind of change which changes the way of living. Still a fact remains that welfare cannot be maximised if a community develops at the cost of somebody else. Therefore, a balance is required between development and social justice. No doubt, development is needed for betterment of the whole economy but it should not be at the cost of some sections of population. Welfare is a very broader concept and welfare of one at the cost of other can never be termed as welfare. Therefore, it is in the broader national interest that the policy should not only take the consideration of beneficiaries but also the losers. As a stakeholder of the society they should be given shareholding in the developmental projects like airports, railway stations, roads etc. so that they will forever have a source of living with that.

Endnotes

1. Paul S and Sarma V, *Industrialisation led displacement and long term welfare: Evidence from West Bengal*, *Oxford Development Studies* 45(3), 240-259, 2017d
2. Samanta D., *Lack of Land Tenure Security as Challenges to Sustainable Development: An*

- Assessment in case of Bihar, India, In ADBI working paper series, July 2018
3. *Compulsory Acquisition of Land and Compensation*, 10 FAO Land Tenure Studies, United Nations, p.12008
4. Saloni Lakhia, *Land Pooling As a Mean of Mitigating Land Displacement in India*, in (ed) *Land Acquisition in Asia, towards Sustainable Policy Framework*, Naoyuki Yoshino Saumik Paul. 169
5. J.A Scumpeter, *The Theory of Economic Development*, Chapter 2, 1934.
6. Lewis A, *Economic Development with unlimited supply of labour*, *Manchester School of Economic and Social Studies*, 22:132-191, 1954
7. Romer Paul, *Increasing return and long run growth*, *Journal of Political Economy*, 92: 1002-37, 1986
- Endogenous Technological Change, *Journal of Political Economy*, 98:S71-S 101, 1990
8. Lucas R E, *On Mechanics of Economic Development*, *Journal of Monetary Economics*, 1-19, 1988
9. Sathe Dhanmanjari, *"Political Economy of Land Development in India"*, *EPW*, P152, July, 16-22, 2011
10. <https://www.downtoearth.org.in/news/agriculture/here-s-why-40-of-india-s-farmers-want-to-quit-61177>
11. Thorner, D.B. Kerblay and R.E.F Smith (ed.) A.V Chayanov *on the Theory of Peasant Economy* (Illinois: The American Economic Association).
12. Sathe Dhanmanjari, *Political Economy of Land and Development in India*, *Economic and Political Weekly*, Vol 46, No. 29, p.153, July 16-22, 2011
13. www.ijhssnet.com/journals/Vol_3_No_7_April_2013/33.pdf
14. <https://www.livemint.com/Opinion/nc5Ugb37fIDiUOp9GK91uM/Developing-a-land-acquisition-poli>



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