Seminar report(TD694)

on

DOUBLING FARMERS' INCOME, PAST TREND, SCOPE, AND POSSIBILITIES

Submitted in partial fulfilment for the Degree of

M. Tech. in Technology & Development

by

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Certificate

This is to certify that the seminar report titled "**Doubling Farmers' Income- Past Trend, Scope, And Possibilities**" prepared by Vishnu Jayan is approved for submission at Centre for Technology Alternatives for Rural Areas (CTARA), IIT Bombay, Powai.

24th April 2020

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Declaration

I hereby declare that the report entitled "**Doubling Farmers' Income, Past Trend, Scope, And Possibilities**" submitted by me, for the partial fulfilment of the degree of Master of Technology to CTARA, IITB is a record of the seminar work carried out by me under the supervision of Dr. Bakul Rao, Professor, Centre for Technology Alternatives for Rural Area(CTARA).

I further declare that this written submission represents my ideas in my own words and where other's ideas or words have been included, I have adequately cited and referenced the original sources. I affirm that I have adhered to all principles of academic honesty and integrity and have not misrepresented or falsified any idea/data/fact/source to the best of my knowledge. I understand that any violation of the above will cause for disciplinary action by the Institute and can also evoke penal action from the sources which have not been cited properly.

Mumbai
24th May 2020

Vishnu Jayan

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Abstract

Economic transformation of a country like India fully depends on the performance of the agriculture sector. This sector plays a vital role in rural livelihood, employment, the raw material for industry and national food security. 70 per cent of the rural household depends directly or indirectly on the agriculture sector. The share of the agriculture sector in the GVA of the country is declining to 16.5 per cent. People who depends on agricultural sector facing many issues in India. Low productivity, high input costs, lack of proper irrigation system and infrastructures, unawareness of modern technologies in the agricultural sector, lack of storage facilities and value addition to the crops, inadequate crop insurance etc. Are some of the major issues faced by farmers. Doubling farmers' income is a policy initiative by the new government aim to double the income of the farmers by 2020. It is focusing on farmers' income than the production rate of the crops. In 2015, Sustainable Development Goals are adopted by many countries. Goal one – no poverty and goal two no hunger are highly dependent on agricultural sector and aimed to improve the sector. This study discuss past trends of farmers income, doubling farmers' income and how SDG associated with doubling farmers' income.

Keywords: Farmers crisis, Doubling farmers' income, strategies of doubling farmers' income, current status, SDG and agriculture.

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List of Abbreviation

NSSO	National Sample Survey Office
GDP	Gross Domestic Production
GVA	Gross Value Added
MSP	Minimum Support Price
GoI	Government of India
DFI	Doubling Farmer's Income
FAO	Food and Agricultural Organisation

Chapter 1

INTRODUCTION

The economic transformation of a country like India entirely depends on the performance of the agriculture sector. This sector played a vital role in rural livelihood, employment, the raw material for industry and national food security. Seventy per cent of the rural household depends directly or indirectly on the agriculture sector. The share of the agriculture sector in the GVA of the country is declining to 16.5 per cent. (Economic survey, 2019).

Development of the agriculture sector in India focused mainly on raising agricultural output and food security. This aimed to increase productivity through better technology, quality seeds, fertilizer, irrigation, incentive structure like MSP, subsidies to agro-inputs, and create new institutions for researching new inventions in the agriculture sector. Due to these activities and green revolution, India's food production is multiplied by 2.25 by last fifty years (1965-2015), which made India not only a food self-sufficient country but also increased the food exporting. (Ayog 2018).

The low level of absolute income and disparity between the income of farmers and non-agricultural workers, which cause agrarian distress in the country during the 1990s. The country witnessed an increase in farmer suicides during 1995-2004. Losses in farming and low income are the primary reason behind this, and it decreases the interest in farming- especially younger age groups, and they started leaving the farming sector. (Ayog 2018).

The government identified the requirements to add more attention to the farmer's well being. It changed the name of the Ministry of Agriculture to the Ministry of Agriculture and Farmers Welfare in 2015, and it promoted farmers welfare to solve the agrarian distress. Based on this, the prime minister Shri. Narendra Modi put a goal to double the farmer's income by 2022-23 to address all these issues. (Ayog 2018).

1.1 Economic value of Indian Agricultural sector

The economic development of India highly depends upon the performance of agriculture and allied sectors. More than 70% of the rural household depends upon agriculture, which is 60% of the total population of the country, and it contributes 17% to the GDP. Foodgrain production is increased by 400% from 1951 to 2011.

Agricultural sector not only provides employment but also it provides raw material to the industries and a market for industrial output. (Arjun 2013).

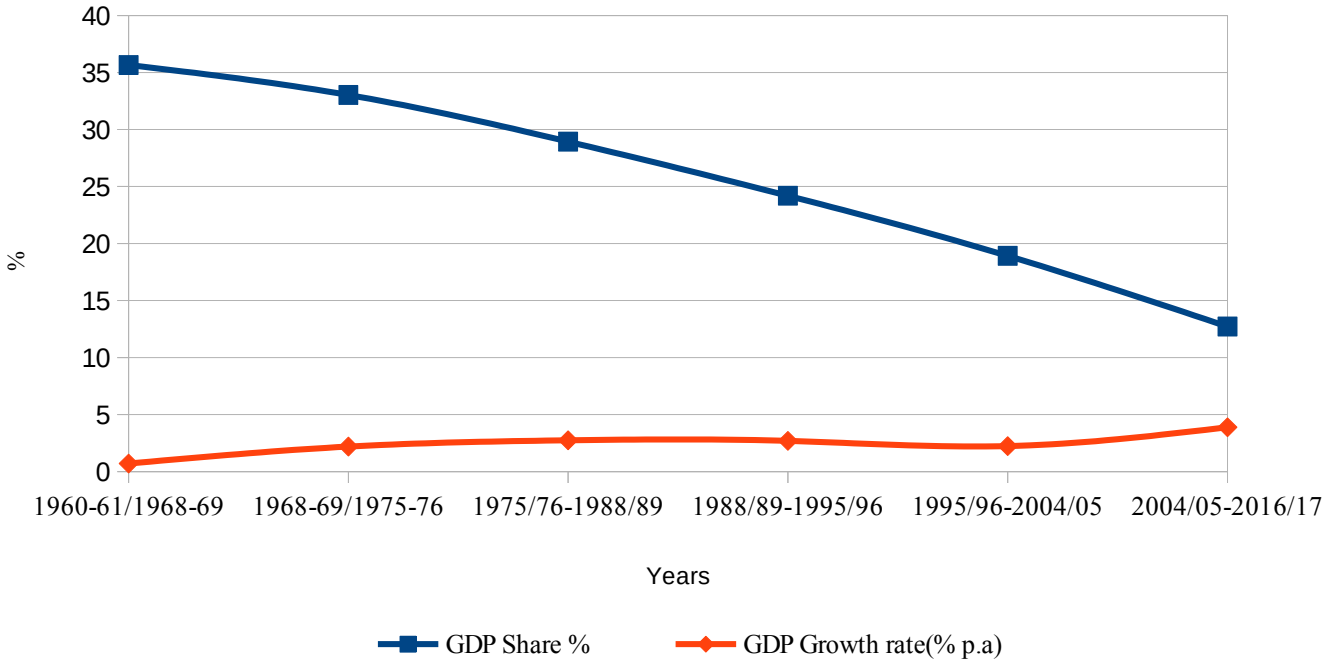

Figure 1.1 Performance of agricultural sector in India (Source: Arjun 2013)

1.2 The major risks in Indian agriculture

In India, cultivation highly depends on monsoon, and the change in nature cause ups and downs in agriculture (Mishra 2008). Other significant risks are diseases and pests that affect the crops, low price for the output in the market which reduces the return from the cultivation, increasing input costs like irrigation cost, labour charges, price of fertilizers and lack of modern technologies and good infrastructure (Mishra 2008). So the significant risks in agriculture are put under these categories- income, yield, price, input, technologies and credits, among others.

The output of the cultivation depends upon weather, water and power availability, pests and quality of inputs. Many times these factors are varying in India, which severely affect the income of farmers and their income is not sufficient for meeting their children's education, the medical requirement of family and other social obligation. Revenue is reduced due to the price distortion through subsidies by the

developed countries, low minimum support price for crops and price volatility due to globalization. (Mishra 2008).

Yield or production loss is an essential reason for farmers crisis. Weather, pests and diseases of plant and quality of the inputs are the possible reasons for the reduction of the yield. This risk is real, and some times it affects severely and nothing remaining for farmer's consumption.

1.3 Problem faced by Indian agricultural sector

Many problems are facing in the agricultural sector in India. The major issues are

1.3.1 Infrastructure and policies

The rudimentary infrastructure and policies lead to slow agricultural growth and which is a problem of concern as 70% of the rural population depend on agriculture for living and employment. Current farming practices are economically, environmentally and scientifically not sustainable, which cause low production. Weak irrigation system and lack of extension services, lack of right roads to access the input market, rudimentary market infrastructure and excessive market regulations are the major infrastructure issues facing in India. Low progress in land reform policies, lack of notification on agricultural systems changed, and tax changes are the major problem by improper strategies and their implementations. (Dwivedy 2011).

1.3.2 Average land hold

The average land hold is small for agriculture in India, which lead to an increase in the cost of farming. From the studies, the average size of landholding by a farmer is 20000 square meter. This plots of land increase the input cost, reduce productivity, efficiency and employment of the people. (Dwivedy 2011).

1.3.3 Poor socio-economic condition

In India, the literacy rate among farmers is insufficient, which is the main reason for the weak socio-economic growth. Lack of technical knowledge and awareness is also leading to low production and adding poverty among farmers. (Dwivedy 2011).

1.3.4 Use of technology

In India, the use of technology in the agricultural sector is inadequate. Lack of adoption of modern farming technologies and farming practices, high cost for

implementing technology in a small land, diverse geography and local context etc. are the major problem facing the agriculture sector. (Dwivedy 2011).

1.3.5 Agriculture depends on weather

The agriculture highly depends on monsoon rainfall because of the absence of a fully developed irrigation system—the variation in rainfall results in the destruction of agricultural production. Temperature also plays a vital role. High temperature reduces the production of the crop. The insurance system in India does not support unfavourable and unavoidable climatic condition in India. (Dwivedy 2011).

1.4 Farmers income

Typically, measuring farmers' well being was based on the level of farm income. From past trends, the market did not support agriculture. The rate of rising of the price of primary commodities is much lower than the rate of rising of the cost of the manufacturing sector, and this is based on trading between agriculture and other areas. (Chand, Saxena, and Rana 2015).

Discrimination against agriculture made a disparity in per worker income in agriculture, and the non-agriculture sector had risen. It caused a decline in the share of agriculture in national income compared to other sectors and the corresponding decrease in the agricultural work-force also. (Chand, Saxena, and Rana 2015).

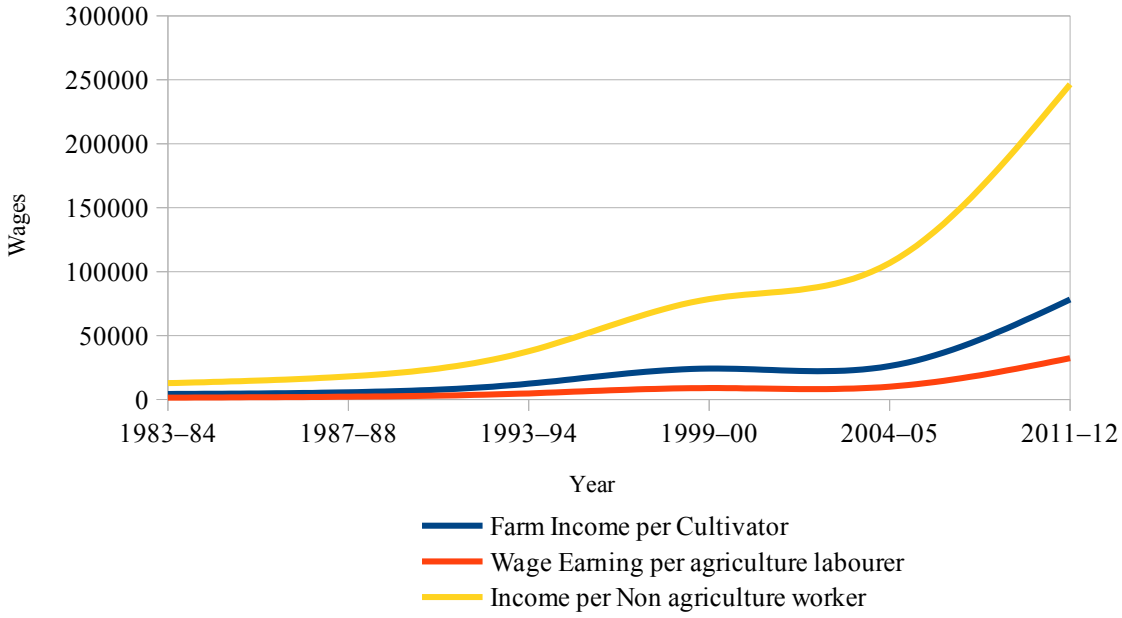

Figure 1.2 Income comparison of farmers, agricultural labourers and non agricultural workers. (Source: Chand, Saxena, and Rana 2015)

The sectoral income of agriculture in NDP was not only farmers income, and it included wages for hired farm labourers and farmers. So the income of farmers was not equal to agricultural income. Now they considered wages for hired labour from the total net production. And also, initially, they were not considering the revenue coming from the livestock. (Chand, Saxena, and Rana 2015).

The expenditure on farming input was increased dramatically from 1983 to 2011. Labour and wage were increased. The costs for fertilizers, irrigation, plant protection, agricultural machines and their repairing etc. Were increased. So thus the farming became more expensive, and the net income of the farmers decreased and which led to increasing the disparity between farmers income and other labour. (Chand, Saxena, and Rana 2015).

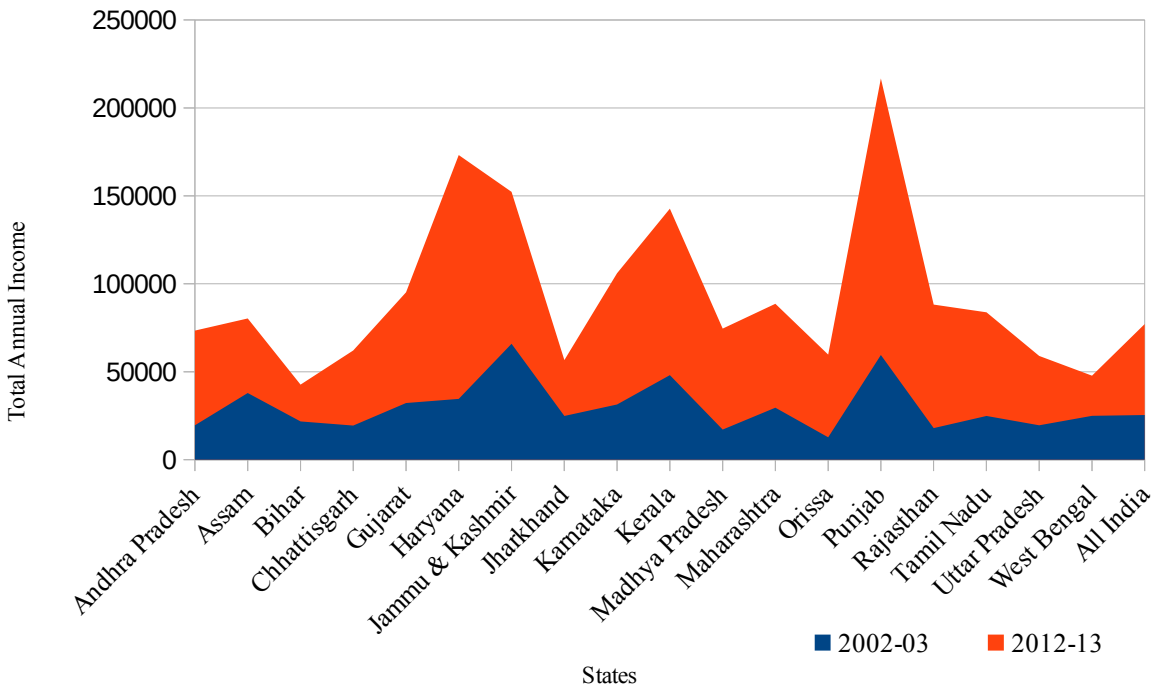

Figure 1.3 Farmers income change computed from NSSO (Source: NSSO 2005 & 2014)

Chapter 2
DOUBLING FARMERS' INCOME

Doubling farmers' income is a policy initiative by the National Democratic Alliance government aim to double the income of the farmers by 2020. It is focusing on farmers' income than the production rate of the crops. The farmers' crisis started in the last two decades. The NSSO survey of 2003 claimed that 40% of the farmers disliked farming due to the low profit, high risk and lack of social status. Many of them do farming because they did not get any other job opportunities in other fields. Also, it showed that 17.5% to 22.5% fall under BPL. The recent studies showed that the income gap between farm and non-farm was increasing and became 1:3.12. (Singh 2018).

DFI is not a new policy. Madhya Pradesh and Chhattisgarh already implemented the policy before the union government declared the DFI. MP is given importance to nineteen points, including increase the yield, agricultural diversification, reduction of input costs, better price infrastructure, expansion of area under cultivation and reduction in the post-harvest losses. MP created a committee with experts farmers from all the districts and chaired by the minister of agriculture. They used Pradhan Mantri Krishi Sinchayee Yojana(PMKSY) and Pradhan Mantri Krishi Mahotsav. Chhattisgarh focused on one seven factors and created more irrigation systems based on Mahatma Gandhi National Rural Employment Guarantee Scheme(MGNREGS) (Singh 2018).

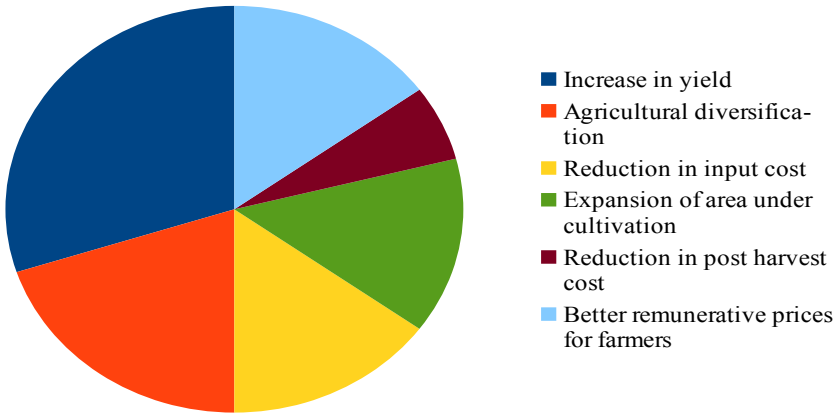

Figure 2.1 Different strategies for doubling farmer's income in MP(Source: Singh 2018)

2.1 Strategies for DFI

Some strategies help to raise the income of farmers which finally lead to doubling farmers' income. These are divided into two main categories, like strategies within the farming sector and strategies on the outside farming sector. (Singh 2018).

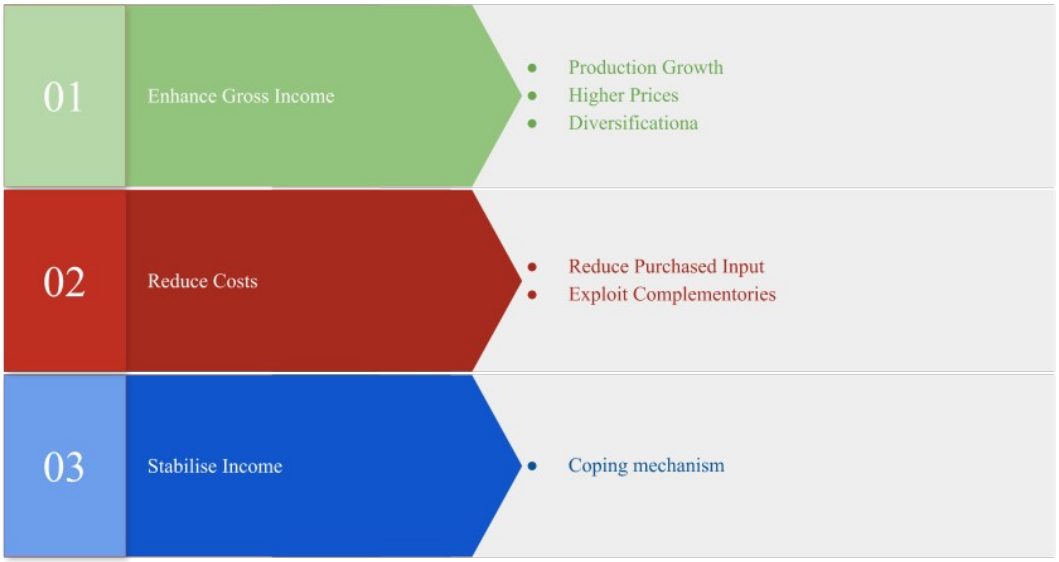

Figure 2.2 Strategies for doubling Farmers' income

2.1.1 Strategies based on farming sector

The first approach is increasing production per unit area as a strategy. It included higher cropping intensity, reducing the cost of production by giving modern technologies, irrigation and productive, informative labourers and facilities for selling the products at a higher price. The government needed to provide support mechanisms, new markets for farmers. Also, the government required to give proper education for the farmers and give low-cost mechanical services to farmers, by the help of startup or private firms. All these steps would help to increase the profit and income of the farmers. But there are also some drawbacks of this method including lack of technologies, non-availability of high yielding crops, lack of funds for sufficient irrigation facilities. So increasing productivity of our farms was difficult. (Singh 2018).

The second approach is to increase the area under cultivation under irrigation. For that purpose, the farmers can use the policies like PMKSY, micro-irrigation programmes etc. Also, governments need to dilute the existing policy for groundwater

extraction policies for farmers and allow farmers to take water from groundwater for agriculture. (Singh 2018).

The third approach is setting up a higher stable price and minimum support price for the farmers, giving more crop insurance and providing the farmer with a risk-free environment for agriculture. Many farmers did not know about these kinds of services given by the governments like Pradan Mantri Fassl Bima Yojana(PMFBY) Studies showed that only 25% of farmers are aware of these services in overall India. The governments need to ensure to provide awareness about these services to all farmers. (Singh 2018).

The last approach is about the diversification of crops. In India, 77% of the agricultural land is used for cereal cultivation, which produces 41% of the total contribution of monetary value to the economy, while, high-value crops like vegetables and fruits are cultivated on 7.7% and contribute 26% money value to the economy by agriculture. (Singh 2018).

2.1.2 Strategies based on non farming sector

Off-farm or non-farming employment like dairy production, handicraft production etc. Would increase the income of the farmers along with the farming. The government make attention to aggro-based MSMEs and provide sufficient marketing for the products. (Singh 2018).

2.2 Significant intervention to Achieve DFI

In order to enhance the production, processing, marketing and non-farm facilities are required for doubling farmers' income by the adoption of aggro-ecological-climate region-centric farming with suitable and sustainable technologies, design of appropriate strategies for reducing post-harvest losses, enhance of storage facilities, value addition, packaging and branding for the agricultural products, strengthening and restructuring of the markets, simplifying and improving credit system for farmers.

2.2.1 Minimum support price reforms

The MSP system in India support farmers to grow more crops. The price of the agricultural products is influencing by international rates than the production costs and production risks and international prices lower than the domestic price. Rise of input costs also reduces the farmers' income. So the MSP should be calculated based on the production cost and farmers' efforts. The current MSP system in India results in

inefficient use of resources like land and water, and unwanted accumulation of cereals. The method of price deficiency payment can be used to cure the drawbacks of MSP. (Kumar 2018).

2.2.2 Rising productivity

The majority of farmers in India included in the small and marginal category and having a small landholding. So rising the income of farmer mainly depends on increasing productivity from the limited land holds and it leads to overexploitation of resources like water and soil, fragmentation in landholdings, and rising of input costs. In order to overcome these issues, substantive investment requires irrigation, seeds and fertilizers, new technology and coupling with high-value agricultural practices like horticulture, poultry and dairying. (Kumar 2018).

2.2.3 Mobile and communication technology

The penetration of the mobile phone into the rural area is fast and wide. The information on agricultural technologies, practices, weather advisories, programme and policies transfer through mobile phone to the farmers. In the long run, it will double the farmers' income by giving an idea to the farmers about the markets, enhance resource use, efficiency, reduce the cost of production and improve the resilience of agriculture to climate change. (Kumar 2018).

2.2.4 Water Resources for enhancing farm incomes

Water resource are very scarce in relation with the area of cultivation, population and availability of other use like industries, households activities-cooking and drinking, sanitisation and washing, and other public users like gardens, park, hospitals. With the growing demand of the water, India is one of the most water-challenged countries in the world.

Due to the scarcity of water, the agriculture need to focus on micro irrigation like drip and sprinklers and introduce the more crop per drop policy along with the expansion of irrigated land area and increase their efficiency. The additional area used for agriculture by irrigation increase the income of the farmer significantly. (Satyasai 2016).

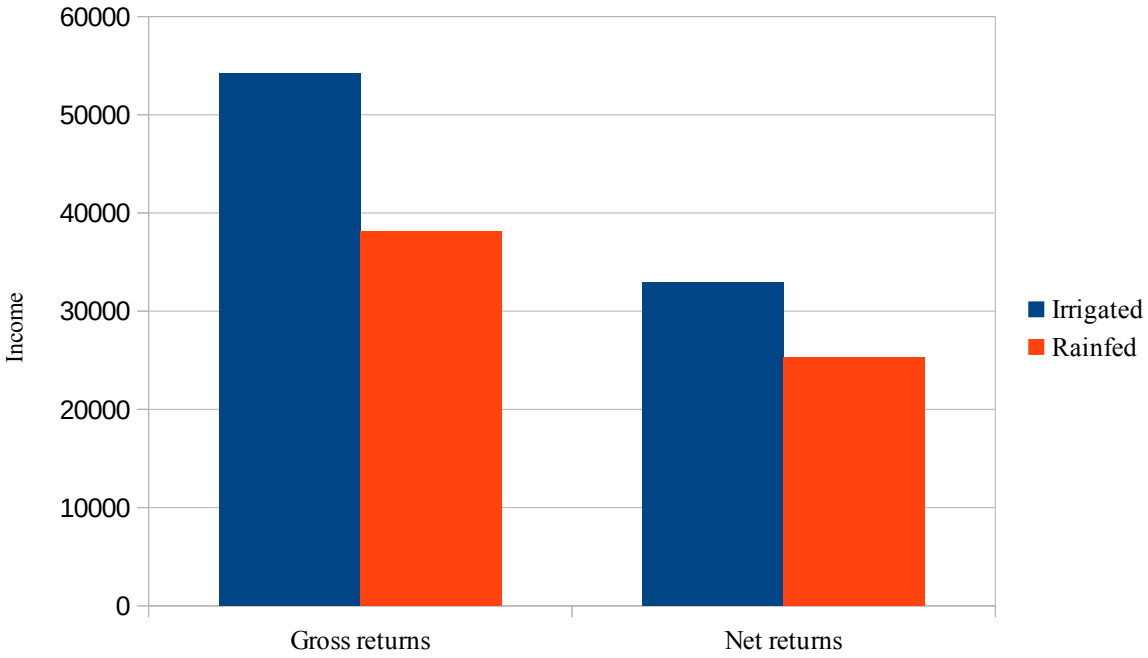

Figure 2.3 Impact of irrigation on income

Accelerated Irrigation Benefi t Programme (AIBP), Integrated Watershed Management Programme (IWMP) and On Farm Water Management (OFWM) etc are some irrigation scheme that help the farmers to enhance their income. (Satyasai 2016).

2.2.5 Smart nutrient management

In India, soils are deficient of micronutrients. NPK balance is away from the norms and reducing Nitrogen. The deficiency in micronutrients severely affects soil health, which reduces the yield of the soil.

The degradation of soil can present by science-led approach and adoption of soil test based application of nutrients to the land. The subsidy system implements to give enough fertilizer to farmers with low cost, which does not increase the input cost that much.

In order to know the level of fertilizers and micronutrients for the soil, soil health card implemented all over the country. The soil health card helps to maintain the nutrients as per the recommendations. The soil health benefits to increase the yield of the soil and efficiency of fertilizer usage, which reduces the input cost of agriculture and helps to increase the income of the farmers. (Satyasai 2016).

2.2.6 Integrated farming system

IFS is an innovative farming practice to efficient land use and animal management techniques together for small and marginal farmers. The entire family labour can utilise for the IFS throughout the year. This approach is essential for increasing the farmers' income, especially in the rain-fed regions. (Satyasai 2016).

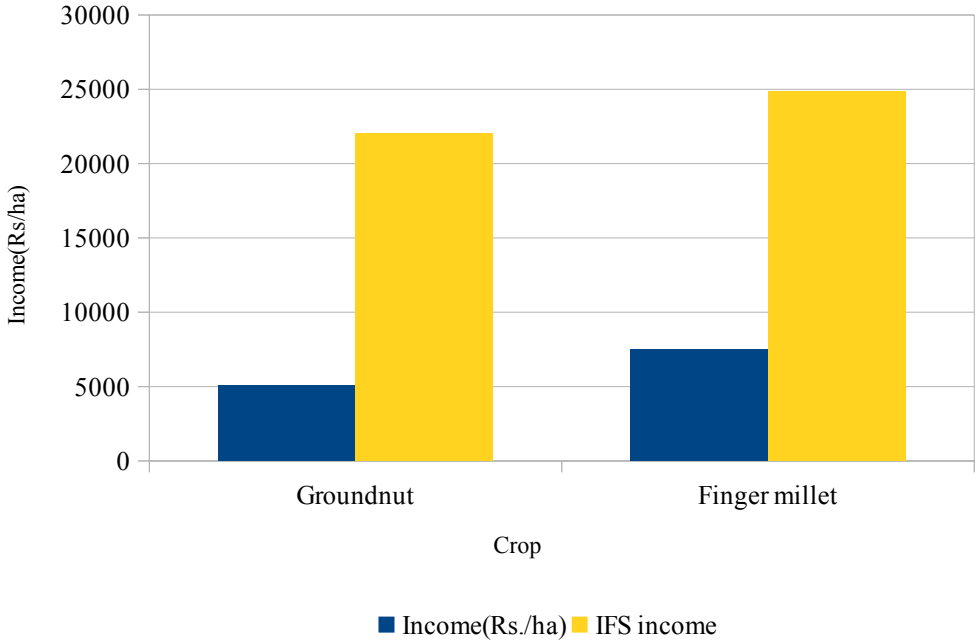

Figure 2.4 Net returns from farming systems (Source: Kiresur 2016)

2.2.7 Diversification & Professionalization

Diversification using high-value crop like vegetables and fruits to improve the income of the farmers and enhance the efficiency of the resources. Diversification is not only limited to the high-value crops, but also towards livestock, poultry and towards non-farm activities. This is ideal for small farmers who have limited land to generate enough income. Diversification gives food and nutrition security, income growth from multiple dimensions, poverty reduction, employment generation, efficient usage of land and water, sustainable development and environmental improvement.

Many factors affect the diversification including rainfall, soil fertility, marketing, storage and processing, investment capacity of the farmers, institutions and infrastructures, government policies, urbanisation and dietary preferences. (Satyasai 2016).

2.2.8 Science and Technology

As per his point, Science and Technology had a critical role in DFI. Genetically modified crops and hybrid crops increase productivity, Science helps in fisheries for making disease-free, high growth rated fishes, and hybrid cattle produce more milk with the short input. Science and technology could develop high yielding and short duration genotypes which produce more income and less stress on land, which sustain the fertility of the soil. Science helped to create more efficient storage methods, which increased the income of the farmers by what saved was earned/ produced strategy, helped to develop high-value crops and proper integration of crop production like beekeeping, fisheries, farm and livestock together to increase the farmers' income. Science and technology would help to increase efficiency by lowering the product duration and higher output generation. (Sendhil 2017).

The introduction of E-NAM- an online platform for trading agricultural commodities in India started in 2016, which strengthens the infrastructure and cooperative markets and thus improve the income of farmers. (Rao et al. 2018).

Chapter 3

SUSTAINABLE DEVELOPMENT GOALS AND DOUBLING FARMERS INCOME

When different government adopted SDGs in 2015, they have welcomed new forms of governance like multi-stakeholder initiatives, public-private partnerships, cross-sector collaboration, partnership with governments and private agencies and policy reforms. This collaboration is essential for achieving SDGs. (Florini and Pauli 2018).

The significant improvement in agriculture is essential to achieving other goals. Estimation of extreme poverty (Goal 1)and elimination of hunger (goal 2) could not complete without the improvement in agriculture. 1.5 Billion people who is staying in small households and constitute for the world's poorest and hungriest people. They are working on tiny fields and produce 80% of the food supply of developing countries and cultivate in 80% of Asia and Africa. (Florini and Pauli 2018).

Increasing in the area covered under organic agricultural practices are directly connected with many SDGs, including SDG 1 (no poverty), SDG 2 (zero hunger), SDG 3 (good health ad well being), SDG 6 (clean water and sanitisation), SDG 12 (responsible conception and production) and SDG 15 (life on land). (Eyhorn et al. 2019).

3.1 SDG and agriculture sector

The vision of SDG on agriculture is to avail food accessible to everyone and which support current and future human needs and maintain the echo system. Food and Agricultural Organisation(FAO) work to promote sustainability in the production system by ensuring decent employment to conditions, economic development, food security and efficient resource usage. (FAO 2018).

The main principles of FAO on sustainable agriculture development are increase production, employment and value addition in the agricultural system, protect and improve natural resources, improve livelihood and inclusive growth to all, better the resilience of people and adopt governance for new challenges(FAO 2018). Some of the principles are,

3.1.1 Access to productive resources

In order to transform the livelihood of the people depends upon improving productivity. Farmers have infrastructure like road, market, land, water sources, telecommunication and storage capacity. Giving more access to the above resources will increase productivity and increase the generate more income.

To achieve the availability of productive resources, distribution of high-quality seeds and planting materials, promotion of investment in mechanisation and technology in rural areas and creation of market which is accessible to the farmers. (FAO 2018).

3.1.2 Encourage diversification

Encouraging diversification in production and income by cultivating verity of crops give many benefits. Conservation of biodiversity, improvement of soil health, reduction of the exposure to pest, disease and weather conditions and generate more income are major benefits of the diversification. In addition to that, it distributes more nutrition to the villagers, more job creation and helps to grow up the economy of the village. (FAO 2018).

Integrated crop-livestock, agroforestry, paddy with aquaculture are some of the successful examples for these kinds of agriculture pattern suggested by FAO. (FAO 2018).

3.1.3 Sharing Information

The SDG give important for sharing useful information, building capacities and investing in technology. Sharing knowledge and technology have an essential role in agriculture system development. Bringing more knowledge will improve farming techniques, which reduce the loss and improve the income of the farmers' household. Low-level technologies are replaced by integrated, farmer-driven methods and required research and advisory services needed to help the farmers and to generate more income. This approach generates more jobs, and the more young generation will interest to work in the agriculture sector. (FAO 2018).

3.1.4 Promote sustainable consumption

The food wastage is a big problem, and it calculated in 2017 as $750 billion per year, which more significant than the GDP of many developing countries. The wastage of food affects badly on both producers and consumers by raising the price of food and reducing the amount sold.

In order to reduce the loss due to wastage, a good system is required to assess and analyse the impact of food losses, food quality, safety requirement, social accessibility and sustainability. Sharing proper information about requirement and technologies to improve the post-harvesting and storage facilities in a rural area will help to reduce the food wastage in a large amount. Lesser wastage means more income generated. (FAO 2018).

3.2 Performance of agricultural performance in different countries

The SDGs are put forward by the UN, and many countries are tried to improve the agricultural output under SDGs. Three countries are compared based on agricultural development.

3.2.1 Nigeria

The economy of Nigeria is mainly depended upon the oil. Agriculture is the major contribution other than the oil industry. Small scale farmers are the major contribution of the overall agricultural production and contributing 90% of the agricultural output, and they are using low yielding production technologies. The major problems were high yield gap between potential yield as per the world bank data, land fragmentation which increases input cost and limited mechanisation, high risk against climate change and weak agricultural services like less infrastructure, technical help and lack of credit facilities. (Gil 2019).

After the SDG implementation, policies are made to reduce the yield gap, which improves the help security, domestic supply and exports. The other improvements are biodiversity and resilience against the climate challenges where Nigeria lies highly rainfall region. The efficient and scientific fertiliser application increased productivity and resulted in soil health. (Gil 2019).

3.2.2 Brazil

Brazil is a highly diversified country based on economy, agricultural production and climatic properties. More than 80% of the rural population depends on agriculture. Brazil is the third latest exporter of agricultural products like soy, beef, coffee, sugar, orange and poultry. After the implementation of SDG goal 2, water productivity and nutrient effectiveness increased. (Gil 2019).

3.2.3 Netherlands

The Netherlands is the second exporter of food items in the world, primarily fruits and meat. The productivity and management of farming land are highly advanced in

the Netherlands. Almost 75% of the farmland is low yielding, and hence high input cost is required. High fertiliser and pesticide usage badly affect the quality of surface and groundwater and reduces the soil health. Biodiversity was reduced by 70% over the last 30 years. After the implementation of SDG helped to increase the biodiversity and soil health in the Netherlands. (Gil 2019).

CONCLUSION AND DISCUSSION

Doubling farmers income is describing what doubling farmers income is and different strategies which will help to improve the farmers' income in India. It underlines that from farming alone can not improve the well being of farmers instead farmers need to do some off farm business or livestock to get extra income. The government should help the farmers by reducing their input cost and improve the market for primary agricultural products. The report also had the doubts regarding the possibilities of doubling farmers income in India because of its diversity, lack of knowledge of farmers regarding new policies, lack of facilities for storing and marketing the crops and unrealisable minimum support prices.

The study brief history of Indian farmers' income growth and the reason for the agricultural distress happened in India. Still in India, there is no proper data available regarding the growth rate of the farmers income. Initially there were some unscientific methods to calculate the farmers income where the agriculture output is considered as the total income of farmers and the contribution of farm workers will not be considered.

The study reveal importance of major pillars in the doubling farmers' income policy. Science and Technology, institutions and Policies are the main contributors for achieving the doubling farmers income in India. It try to explain how technology can reduce the input costs and increase the yield of the crops, new agriculture practices with high value crops, integrated farming and ICT. The institution can make new ways and open new areas for the agriculture sector. It study to describe this with the help of irrigation and drought control. Policy also has an important role for doubling farmers' income. Some of the current rules and acts need to be modified for getting more benefits to the farmers. Also it explains how SDG gives more importance and new opportunities for the agriculture field to make new agro businesses and how public private partnership policies are evolved for increasing the farmers income.

Based on all these readings, we get an abstract idea about what is doubling farmers' income, how it will work, what are the strategies used for DFI and how SDG help to improve the DFI.

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