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Review Article

Doubling Agri-Income: An Era of Upskillment

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A B S T R A C T

The paper tries to review the agricultural status and strategies for doubling the agricultural income by upskillment of the labour force. Though agriculture is the major source of employment in our country but its contribution towards GDP is quite poor i.e 17% with an agricultural employment of 49%.Unlike developed countries like U.S.A, where agricultural workforce of 0.7% contributing 1.10% towards GDP. The reasons behind such poor contribution are lack of skills of agricultural workers in various operations, the workers are extremely vulnerable to exploitation on account of their low level of literacy, awareness, social backwardness and absence of unionism and other forms of viable organization to represent them. Apart from these, skill gap exists within the farmers or agricultural labourers which are one of the greatest problems for getting remunerative wages in rural labour market for qualified young people. Agricultural knowledge and skill building represents an effective tool to improve the labour market situation in the rural areas and can be viewed as devices to improve the efficacy and contribution of labour to overall production, but the biggest challenge is not only to improve the quantity of skilled labour but also the quality of workforce. It has been found that there are lot of skill gaps in our country like the technological, knowledge, mechanical and management skills which results in poor performance. In this era of development it has become a necessity to upskill the labour force for doubling the agricultural income of the country through effective and efficient measures for sustaining a sound economy. Keeping in view, the necessity of skills in agricultural workforce, the central and state government have framed up some Reforms and Implementations along with use of regenerative agriculture, highly equipped machineries and ICT tools is given importance to improve the condition of large and marginal farmers of our country. With regard to the other publications given by the NGOs and research scientists, some be beneficiary strategic ideas have been discussed for better economic growth and efficiency of agricultural labour in India.

Keywords

Up skilling, Labourforce, Efficiency

Introduction

Agriculture is a critical sector of the Indian economy holding the second largest agricultural land in the world. Major part of the country's population earns its livelihood from agriculture. This sector contributes about 17% to the GDP of the country that is very minimal with the employment contribution of 49% (CIA 2015). India is one amongst the "young" countries of the world that is growing steadily with the work force proportion in the age group of 15-59 years. But only 2% of the total employees have undergone the skills development training in India (FICCI, 2010).India faces the dual challenges of severe paucity of highly-trained and quality labour, as well as non-employability of large sections of the educated workforce which possess little or

no job skills. As per the survey carried out by the National Sample Survey Organisation in the year 2009-10, the largest segment of workers i.e. 24.6 crore is in the unorganized sector. Labour is one of the important inputs for increasing production in agriculture. At this stage of development, the increase in labour supply is only not important but also upskilling efficiency of the labourers is very crucial to meet the demand of the country in the coming years. This paper provides comprehensive review of present status of Indian agriculture and future strategies for up skilling agricultural labour. The recent Demographic trends published by the Planning Commission estimates that India will be the 2nd most populous country by 2025 for contributing about 17.5% of the world population. Modernizing agriculture involves introduction of new technology that requires, increased use of capital in agriculture and intensification of labour for the betterment of agricultural productivity. Thus skill development of labour is a critical input in modern agricultural development. Therefore, capacity building of farmers as well as agricultural labours in operation of various agricultural activities is an urgent need for development of an economy like India. Diverse rate of adoption among farmers depends on nature of requirement in financially supporting a new technology (Feder & O'Mara, 1981). Both public and private organizations are involved in capacity building programmes for farmers as women and rural youth. The Indian Council of Agricultural Research (ICAR) alone trained more than 1.0 m farmers and extension personnel. But in India, the lack of demand in orientation of vocational training and skill development projects often resulted to unemployment as well as large number of activities could not grow properly for inappropriate skilled manpower (Gupta, 2006).The income in off-farm activity is increasing and depending on such options farm families may not completely rely on income generation from farms alone. (Weersink *et al.,* 1998).

Employment scenario

Agriculture is not just a source of employment for the male counterpart but also for the women of a household. It plays a significant role in overall socio-economic development. Therefore, fostering rapid, sustained and broad-based growth in agriculture remains key priority for the country. With this declining rate of employment in agriculture, it is an arduous to meet the increasing productivity demands of the economy which is the key to growth and it needs to be accelerated. Usually, as an economy matures, there is a movement of excess agricultural workers from low productivity agriculture to higher productivity sectors like manufacturing and services, and thus, from rural to urban areas and from lower wages to higher wages. The pace of this movement accelerates with higher economic growth, which gives rise to greater job opportunities in the non-agricultural sectors. Goldman Sachs (2014) calculated that labour is 4 times more productive in industry and 6 times more productive in services compared to agriculture. Higher productivity usually implies higher wages. Thus, there is a natural movement away from agriculture, such shifts are also coupled with technological advancement of the primary sector leading to lower labour intensity and higher capital investment in several instances.

The above Graph-1 depicts the projected percentage of employment in the coming years, the existing condition and expected decline of future employment status of agriculture in the country. This linear trend line is used in this graph clearly defines how

agricultural employment have been declining over the years.

The declining trend in the employment of agriculture, propel to take some initiatives to improve the efficiency of the agricultural labour. So that, better productivity could be obtained by the existing level of employment and the initiativeness should be taken in a way to get the height of productivity with minimal of labourers being engaged. In agriculture, lack of irrigation facilities and lack of formal sector credit are the two principal bottlenecks for increasing agricultural productivity. The uninformed use of pesticides, fertilizers, hormones in livestock etc are become a major roadblock to our export, effort of agricultural, horticultural, livestock and marine products. Therefore, skillful training of farmers, adequate information on new varieties of seeds, and fertilizers, implementing of new farming techniques are playing important roles in this field.

This further necessitates acquiring new skill for application of those knowledge.

In India, the agricultural labourers are classified on the basis of their land holding. They are classified as Marginal, Small, Medium and Large Farmers. The employment and skills of this agricultural workforce is based on their land holdings.

It has been seen that the large farmers are more skillful because of their exposure and affordability to the new technologies, whereas the small scale farmers lack such facilities. As shown in the below Graph.2, in our country small and marginal farmer hold the major percent of the workforce level that results in poor contribution to GDP. But this can be turned into an opportunity by giving them proper skills development training for improving their performance.

The above graph shows the level of workforce involved in agriculture based on the land holdings. As per the agriculture census, it is clearly evident that maximum worker per hectare is involved in marginal lands. The total workforce involved in per hectare is 0.86.The least number of workers are involved in large farms as these areas are completely machine operated.

Skill gaps in Indian Agriculture

From the present condition of the Indian agriculture, it is understood that there lies a huge gap of skills in the working of the agricultural labourers that results into poor productivity and less contribution towards the country's economy. The agricultural workforce have lack of skills in-

Knowledge Level

Knowledge has been found to be an important factor contributing to the adoption of innovations by farmers (Pandey *et al.*, 2014).If the knowledge level and the skills of the farmer is improved then, there is a scope of improvement in the productivity. But in India, illiteracy acts as a major hindrance adopt the new ideas and perform better. This can be worked out by educating the farmers along with skill building training can be an important factor that gives a boost in rural and economic development of a country.

Technological Skills

There was a time when technology and agriculture were considered as two different ends of the spectrum and mutually exclusive. It includes features of technologies that reduce cost of production and enable farmers to take less risk, so as to cope with farm intensification (Aune & Bationo, 2008) Knowledge of

where technology is moving, particularly in terms of agriculture practices, is incredibly important. This includes a focus on things such as irrigation, pesticide-use, and improving methods and techniques of cultivation, harvest, storage and transport. This also means agriculture professionals need to embrace technological development and improve their technological skills. Among resource poor farmers' technology provision involves sharing of technical knowhow through demonstration as well as their social context (Aklilu *et al.,* 2008)

Mechanical Skills

The farmers should have proper knowledge of the various instruments and tools that are operated during various farm operations. In these era of new technology modern machineries are necessary to be used for faster way of production. But, due to the lack of machine knowledge, skills lag behind. Adaptability to change can effectively execute through social capital linked to trust between farmers that increase utilization of innovation (Koutsou *et al.,* 2014)

Management Skills

Organizational skills may be a strong determining factor in one's success in this role. Time management, capacity management, training management and skill management are also important for those in the field. Management skills can be used to keep yourself in check, allow you to manage your business associates better. Human resources include overall human potentials within an organisation: the available knowledge and experience, usable skills and abilities, possible ideas and creations, the level of motivation and interest in the achievement of organisational objectives, etc. (Samardzic *et al.,* 2016)

Skill has become one of the important aspect for farmers as it will help them to contribute towards the National GDP, as India's GDP and performance of the agriculture sector is quite poor as compared to other countries.

In the figure below, it shows the productivity and employment comparison of the different countries. It is evident from the graph that Indian Labourers lack skill which as a result shows up in the productivity of the country as compared to USA which contributes 100% to productivity with only 2.5% of employment. Similarly in Britain there is 78% productivity with 1.2% of workforce, making it clear that skill is the important factor that hinders the growth of the country's economy.

The economic growth and social development of a country is mainly driven by Skills and Knowledge of that country. Thus, Skill building can be viewed as a device to improve the efficacy and contribution of labour to overall production. The challenge pertains not only to a huge quantitative expansion of the facilities for skill training, but also to the important task of raising their quality. Skill building could also be seen as an instrument to empower the individual and improve their social acceptance.

It is seen that persons with better skills and knowledge are more adjustive to the challenges in various situations. Availability of highly skilled workforce in this unorganized sector is a major boon to increase the competitiveness and potential of this sector. Providing appropriate skills in the right way is a key challenge to improve the stability in farm sector and also to accelerate the pace of rural development that can help in the development of the human development index and standard of living of the labourers.

Strategies for upskilling

Although agriculture is a state subject, even policies implemented by centre have an impact on it. Some of the strategies given by government at different level are focused to improve the contribution of the labour force. The effectiveness can be seen when the strategies work out for the betterment as per the plans.

State Government

Free up land lease market- In India, various tenancy regulations have restricted the consolidation of holdings which is an essential step in this sector.

The extent and nature of agricultural tenancy regulation and restriction varies from state to state. With implementation of such regulations the labourforce will be reduced, therefore the upskilling of the workers is necessary for better performance.

Custom hiring model-This reduces the capital requirement of farmers while giving them the opportunity to mechanize farming.

It will be beneficial for the farmers to develop their skills to understand and make the fixed cost of buying farm machinery prohibitive for large and small land holdings. APMC Reform-State governments had introduced agricultural produce market committee (APMC) acts to create a network of mandis (markets) where prices would be determined through auctions. Therefore, knowledge about the prices of commodities and skills for proper auctioning of the commodities. The primary reason is to shield farmers from moneylenders and traders.

Central Government

MGNREGA Reforms- The inclusion of agricultural activities under the auspices of the MGNREGA is a demand of the farming community. This would ease some of the pressure on the farmers due to increasing wage rates and at the same time provide employment to the landless labourers.

Invest in Research- India's spending on agricultural research was about 0.4% of agricultural GDP in 2009.

This is a sign of lack of focus on research and translates into relatively little knowledge being created. This enhanced knowledge has to be used as precursor for skill upgradation. The labour class in India is divided into categories-The Small and Large Farmers. Based on the categorization the strategies are discussed for an effective result in short time period.

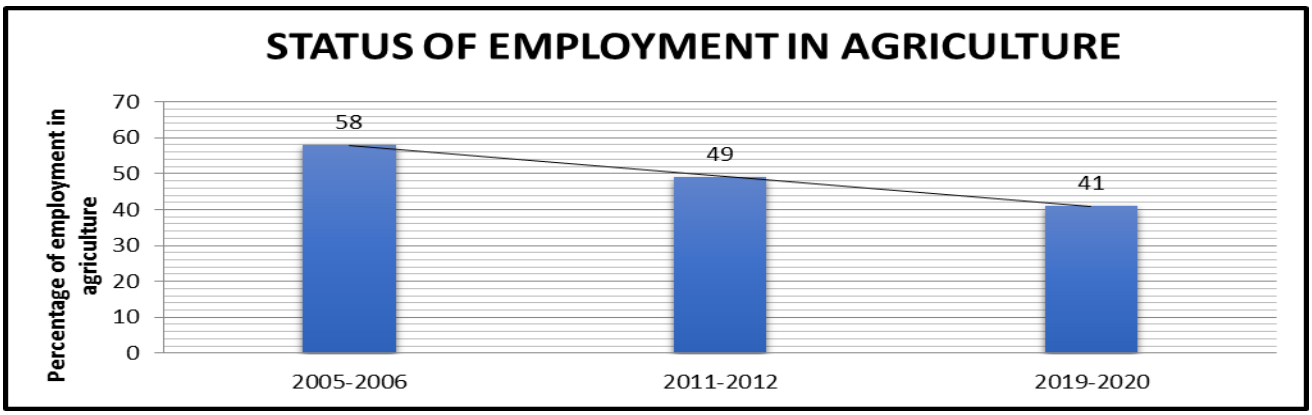
The strategies should be such that it should be economic and easily adaptive by them.

Table.1

SI. No	Country	% of machinery & equipment
1.	India	17.7
2.	China	17.5
3.	Japan	72.9
4.	U.K	46.5
5.	U.S.A	43.3
6.	Australia	12.2

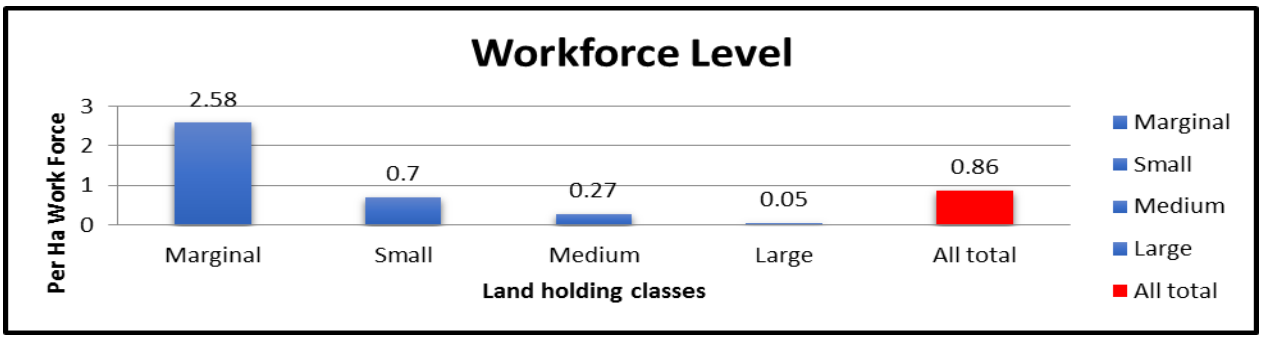
Source-FAO Yearbook, 2013

Graph.1



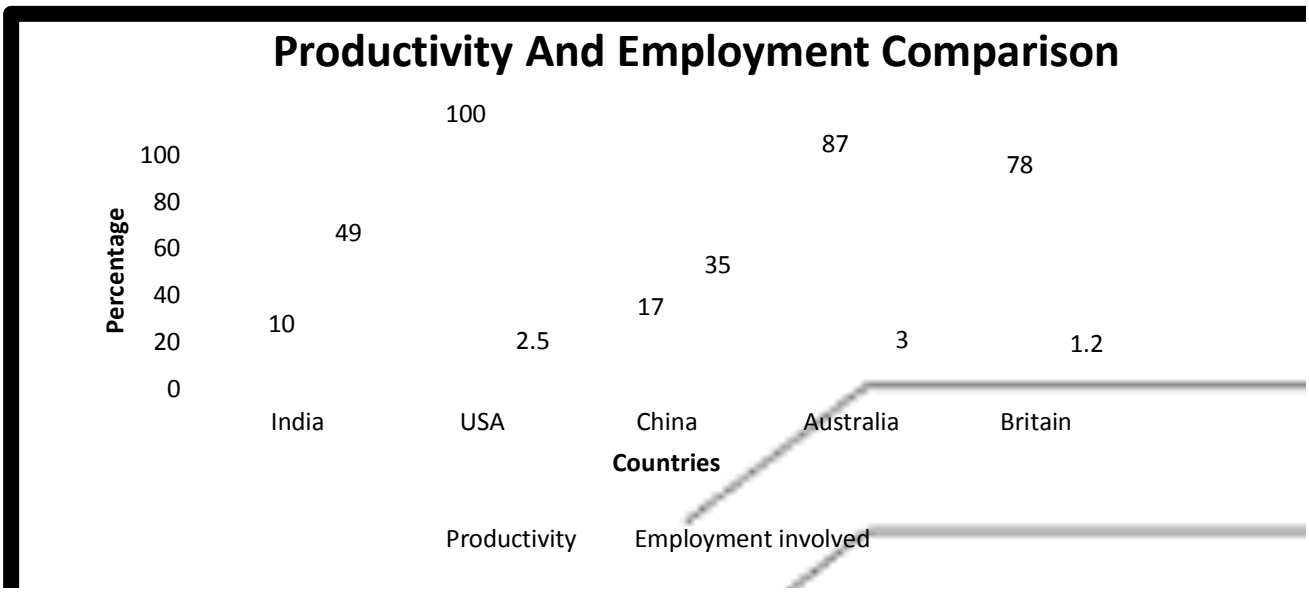
Source: Planning Commission, Economic Intelligence Unit, KPMG Analysis

Graph.2



Source- Agriculture Census (2010-11)

Graph.3



Source-National Planning Commission (2008)

Strategies for small farmers

For the marginal and small scale workers it is necessary that they should opt for regenerative agriculture system where the Indian Farmers should try to practice agriculture with some techniques for better production in less area.

Polyculture-"Polyculture" refers to growing many different species of plants (and animals) in one area. This technique is very common in modern industrial farming and particularly common in small, subsistence agriculture around the world. For the marginal farmers the upskilling of cultivation will give better results. The vigorous growth of stems and leaves as well as the roots of papaya and banana raised as intercrops are a clear proof of the favourable synergism of pineapple. Competition for nutrients may exist and reduce the growth of one of the crops in an intercropping system only under insufficient supply of nutrients. (Angeles 2008)

Thermal compost-"Thermal composting" to the soil is done in order to replenish the missing microbe populations. A one-time application of compost or compost tea is usually all that is necessary as long as destructive farming practices (tilling, fertilizing) are stopped. In this technique, skills are needed to prepare the compost well for maintaining the fertility of soil.

Permaculture- In this system of agricultural and social design principles centered on simulating or directly utilizing the patterns and features observed in natural ecosystems. It aims to develop sustainable architecture and regenerative and self-maintained habitat and agricultural systems modeled from natural ecosystems. Permaculture is defined as a way of life, living and sustainable farming, which directs users to the conscious use of a number of principles, among which for sustainable agriculture important to crop biodiversity (Acko *et al.,* 2013)

Keyline Subsoiling-. It is being used extensively used in some developed countries to decompact and aerate degraded soils, improve soil moisture holding capability, and create a more hospitable environment for soil microbiology - the true soil builders. The farmers need to upskill themselves with the moving world of technologies.

It is not only important to use these techniques but it is also important to improve knowledge about using these techniques effectively.

And this is possible only when the skills of agricultural labourers are improved to utilize the new farm mechanization agricultural techniques for better productivity. Farm Mechanization can be improved by using high power inputs with low control, power intensive work.

Strategies for large farmers

It is easy for the large farmers to improve their efficiency more by using more and more technologies in there work so that maximum output is obtained with minimal workforce but with the use of effective and multipurpose machineries.

Highly Equipped Machinery

The automation of machine tools that are operated precisely end-to-end component design is highly automated using computer-aided design (CAD).Advanced computer aided engineering (CAE) methodologies, which have been applied successfully in design and manufacturing operations in

many industries for many years, may be useful in the design process of tillage tools to prevent failures of the machine elements. (Celik *et al.,* 2013)

Use of Information Technology

It is considered a subset of information and communication technology (ICT). In the context of agriculture, IT is used to make direct contribution to agricultural productivity.

Technological skills for the farmers should be enhanced by proper trainings on potential applications in agricultural extension especially in accessing required information and knowledge.

Geographical Information System (GIS)

A geographic information system (GIS) is a technological tool for comprehending geography and making intelligent decisions. GIS maps are interactive. In this era of technology, farmers need to build up their sense of skills. The ability of GIS to analyze and visualize agricultural environments and workflows has proved to be very beneficial to those involved in the farming industry. In the strictest sense, it is a computer system capable of downloading, storing, analyzing and displaying geographic information. (Sladic *et al.,* 2014)

Remote Sensing (RS)

It is the scanning of the earth by satellite or high-flying aircraft in order to obtain information about it.It can also be referred as the process of gathering information about an object, at a distance, without touching the object itself. Remote sensing has been found to be one of the most useful technologies for the applications in the various field of agriculture. (Baruah 2010).

Global Positioning System-

It (GPS) is a combination of many components. The GPS is also useful for real time mapping and automation control, involving such technology as automatic boom section control and automatic seeder/planter shut-off control.

Use of Artificial Intelligence

Robotics

Robotics and automation can play a significant role in society for meeting 2050 agricultural production needs. For the last two decades robots have played a fundamental role in increasing the efficiency and reducing the cost of industrial production and products in the developed country. Advances in sensors and control systems allow for optimal resource and integrated pest and disease management. If the efficiency of the farmers are improved they can reach out to the next level of agricultural development. This is just the beginning of what will be a revolution in the way that food is grown, tended, and harvested. Manual harvesting of dates from selected bunches is an utterly expensive (Loghavi and Abounajmi, 2001). It is also a time-consuming process. Let aside that it requires skilled labour that receive high wages.

Drones

Agricultural drones are becoming a tool like any other consumer device. Drones are more formally known as unmanned aerial vehicles (UAV). Essentially, a drone is a flying robot. The aircraft may be remotely controlled or can fly autonomously through software-controlled flight plans in their embedded systems working in conjunction with GPS. A UAV is an appropriate tool to

perform multi-temporal studies for crop monitoring at low altitudes. (Torres-Sánchez *et al.,* 2013)

In India, now the major problem is skilling and reskilling the labourers to harness and enhance for getting a better and positive growth outcome for the economy at large. Development should be done by improving their technical training and building manpower for growing economy.

Realizing this, the Eleventh Five Year Plan of India has set up a Skill Development Mission (SDM) consisting of an agglomeration of programmes and appropriate structures aimed at enhancing training opportunities four-fold. New entrants to the labour force in the non-agricultural sector should increase from the existing 2.5 million to 10 million per year in the country, and they need to be trained.

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