

Technology for sustainable rural development

Abstract

Agriculture sector remains the largest employer particularly for the majority of population still living in villages of India. Farm productivity is low, as supply chain losses are amongst the highest in the world. Income from agriculture for the household is coming down leading to poor quality of life. This loss has been substituted by high input based agriculture predominated by chemical fertilizers and pesticide as a source for soil nutrient and protection against pests. Rural youth migrated to cities in the hope of better life have not found the grass as green even on this side. Markets aided by technology can only enable opportunities in rural settings, thus creating mediator-ship between farmers and markets, towards their sustainable quality of life.

Keywords: young nation, challenges, population, agriculture

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Introduction

India is facing gigantic challenges being a young nation and in creating useful occupation for the increasingly educated unemployed young population. Our support institution and policymakers use archaic; particularly so in agriculture remains the largest employer particularly for the majority of population still living in villages. Farm productivity is low supply chain losses are amongst the highest in the world, income from agriculture for the household is coming down, interest in agriculture is going down and farmers are migrating for better employment opportunities in fast growing cities. While policy makers have acknowledged that agriculture extension system has collapsed in India today, new challenges have also emerged for the sector, especially climate, variability, decreasing soil fertility, globalised market, reducing groundwater table besides many others.¹

Agriculture turning into un-economic activity

Given the scenario, the envisioned second green revolution needs much more to be done than wishful thinking. Getting the rural youth back to agriculture and making agriculture a gainful employment opportunity cannot be done without effective use of technology and aid the much needed long delayed land reforms to encourage investment in agriculture and its value chain.²⁻⁴ India is often called a land of paradox, we are the largest producers of the food in the world along with largest food market, given these facts it would be obvious for an analyst to presume that such a market will be well organized. Interestingly enough the entire sector is grossly unorganized, lacking basic infrastructure, institutional financing of value chain, huge wastage and poor productivity, leading to higher food cost index inflation; benefits of which never reaches poor producers perpetuating to debt and poverty. The paradox continues in education; India also produces largest number of agriculture graduates from its universities in the world, interestingly enough 95 percent of these graduates do not engage in agriculture.⁵

Growth of industry and service sector in proportion to the demand for the employment is lacking severely in spite of India being one of the fastest growing economies in the world. The last resort remains "self-employment" for these millions. Unfortunately for this vision, policy and support framework are severely lacking. More than the urban entrepreneur, the rural entrepreneur is disadvantaged with virtually non-existent incentive at primary level chain of agriculture.⁶

The village, agriculture and livelihood

Social unity of a village has always got under played in the larger development debate owing to considerable lack of economic development and opportunities creating greater disparity and fight for limited resources, increasing pressure of market and years of shift in production system from a food source to income source has led to loss of traditional practices associated with farming and soil management. This loss has been substituted by high input based agriculture predominated by chemical fertilizers and pesticide as a source for soil nutrient and pest protection. However, while agri-input have made inroad into farm practice; farm advisory services for the new crops, have not small and marginal farmers are the ones who are hit more by this changing situation, having no access to formal education/inputs on better crop management practices for new crop varieties required by the market. Most farmers get advice from hearsay or peer group instead of institutional agencies.^{7,8}

Even after globalization, economic reforms, liberalization, and the real India lives in villages with over 65 percent population of a billion plus people. 70 percent of farmers operate under one hectare and are severely resource constrained increasing their dependence on the crops largely wheat, maize and barley as major source of livelihood.^{9,10} The average farm size is 1.060 hectare but average area owned is only 0.72 hectare per rural household as per national sample survey office of 2016 with property rights and family divisions the land sizes continue to go smaller. The land sizes have become so small that gainful employment cannot be sought from them even if farm productivity increases significantly. Livelihood diversification as multi-cropping systems is the need of contemporary farming society.^{11,12}

Technology enabled development

Many issues relating to countryside population cannot find solution through short term policy changes, but can give a considered outlook towards issues facing rural populations while infrastructure in the form of roads (Pradhanmantri Sadak Pariyogana), electricity and housing (mostly through remittance money) are improving, options and opportunity for livelihoods are not sufficiently enough for small and marginal farmers. Rural youth who have migrated to cities in the hope of better life have not found the grass as green even on this side, bad living and working conditions with bad economy have encouraged most to evaluate other options. However, villages do

not offer livelihood alternatives that the youth can willingly choose, given that agriculture alone cannot give (in the given circumstances) gainful employment towards the sustainable quality of life. Right set of measures, support policies, enabling environment and incentive for markets aided by technology can only enable opportunities in rural settings.^{13–18}

Conclusion

Agriculture sector has been proven uneconomical due to increased input costs and the benefits of food inflation do not pass on to the producers, perpetuating to debt and hence migration. Indian cities are in throngs of development. Much of the labour supplied for this rapid development is by the rural 'seasonal' migrants looking gainful employment from uneconomical agriculture in the villages. While development for these cities is desirable, clusters of slums and unplanned development becomes hindrance in the process, as most of these migrants are unable to afford the living costs, they seek settlements which are illegal and do not have basic amenities. Such settlements are more a problematic to the law enforcement agencies local population as well to the city administrators. Hoping or even envisioning a substantial shift of this 70 percent population from rural country side to cities might be visionary but considering the experiences of China, USA and Russia, such shift is not desirable while also not sustainable. Creating opportunities in villages for rural youth for gainful employment and good life is a better wiser alternative.

Market based alternatives for their quality and healthier life are needed to bring about the change needed for rural livelihoods to improve, for which ecosystems needs to be invested in. These enabling ecosystem are land reforms (clear land ownership rights), incentives for businesses for investing in primary value chain in agriculture (at farm gate), storage and cold store infrastructure, logistics and most important tax breaks and financing mechanism for each of these values chain necessities to unlock market value of the sector. These reforms would provide incentives for investments to flow in agriculture sector and allow micro entrepreneurs to cash in on the opportunity for creating primary level value addition based enterprises, creating employment opportunities and generating income for their sustainable quality of life benefiting himself and futuristic society. The need is to be bring about systematic changes, unleash entrepreneur and believe in the power of youth to bring about the changes we seek to see in our villages and it can change.

As Mahatma Gandhi said: “*ur salvation can only come through the farmers, Neither the Lawyers,*

nor the doctors, nor the rich landlords are going to secure it”

---- *Farmers and workers.....Make India.*

Their poverty Is India's curse and crime.

Their prosperity alone can

Make India country

Fit to live in.”

Suggestions for the planners and policy makers

Firstly precision agriculture can help in multi crop production in environmental friendly way by using specific knowledge on the spot. It can reduce environmental deterioration only when the fertilizers and pesticides are used conservatively. Secondly, if we wish to meet the demands of improved yields without compromising to public

health and environmental equilibrium, the new incentives and policies for ensuring sustainability of agriculture for Small and marginal farmers the services of eco-systems shall play a crucial role, Thirdly the household food and livelihood security of farmers, lies upon the “Sustainable” agriculture systems and are often identified by levels of their efficiency.

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Conflicts of interest

The author declares that no conflict of interest exists in publishing this article.

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