Crucial Study on the Irrigation & Technological Challenges Faced by the Farmers & its Solution

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Abstract
Irrigation is the most important agricultural input in a tropical monsoon country like India where rainfall is uncertain and unreliable. Indian farmers can't achieve success until more than half of the cropped area is brought under assured irrigation. There is no question that irrigation systems have been haunted for decades by a multitude of problems. Technological backwardness is one of the biggest reasons for lacking of irrigation system in India. Due to unplanned water resource management and lack of technology, country's irrigation system is going down and as a result of that farmers are committing suicide. In India, latest agricultural machines have not been used. Agriculture in larger parts is still carried on by human hand using simple and conventional tools and implements like wooden plough, sick, etc. This hampers the development of agriculture. Lack of inefficient transport makes the Indian farmers handicapped. Even today many villages are not properly connected. During the rainy season most of the roads in India became useless and farmers cannot carry their goods. If these problems were not solved, poor farmers have to suffer a lot. Use of latest technology and building a good infrastructure can make the difference. .
Keywords: Irrigation, Agricultural, Technological, Infrastructure, Backwardness, Development.

Introduction

India is one of the few countries in the world endowed with abundant land and water resources. The average rainfall in the country is estimated to be over 4000 cubic km spread over the geographical area of 328 m ha of which 185 m ha is cultivable. Due to tropical climate conditions, India experiences vast spatial and temporary variation in the rainfall. About one third of the country's area is drought prone. The Southern and Western parts of the country comprising States of Rajasthan, Gujarat, Andhra Pradesh, Madhya Pradesh, Maharashtra, Tamil Nadu and Karnataka are drought prone. On the other hand, the areas subjected to periodic floods are mainly in the Northern and North Eastern parts of the country comprising States of Uttar Pradesh, Bihar, West Bengal, Assam and the seven North Eastern States.

As global population growth continues to soar, food security the availability of and access to food is an increasing concern. At the same time, high costs and inefficiencies have made farming an increasingly unviable profession for small farmers in developing countries. Human life depends on food, and in developing countries most of that food is produced by small farmers. Despite the vital role farmers play in food security, most struggle to make a living—and many more are leaving farming to pursue economic opportunities in urban areas due to insufficient management of irrigation system. Government subsidies and other assistance provide some relief, but many small farmers remain illiterate and impoverished, with limited access to mainstream services. They operate in isolation, with little or no bargaining capacity. They also lack access to capital and credit as well as high-quality agricultural practices and markets that could improve their productivity.

In Asia, for instance, yields could decline by between 20 and 40 percent if no effective adaptation measures are taken. In addition, extreme weather events such as droughts and floods are becoming more frequent, causing greater crop and livestock losses. Also an increasing demand for bio fuel feedstock may put additional pressures on global agricultural production. New technologies will be needed to address the problem of rapidly increasing water scarcity, and also to reduce post-harvest losses. Addressing these challenges will require pushing the technology frontier outwards, including in marginal areas. This could be achieved by developing and disseminating new technologies and crop management techniques but also by making already existing technology available to small farmers in developing countries. In order to ensure a wide uptake of modern technologies, it is indispensable that resource-poor smallholder farmers are not bypassed by technological progress. Yield gaps exist mainly because known technologies that can be applied at a local experiment station are not applied in farmers' fields having the same natural resource and ecological characteristics. One main reason why yield gaps exist is that farmers do not have sufficient economic incentives to adopt yield enhancing seeds or cropping techniques. This may be explained by numerous factors, including lack of access to information, extension services and technical skills. Poor infrastructure, weak institutions and unfavourable farm policies can also create huge obstacles to the adoption of improved technologies at farm-level.

FAO estimates that some 1.2 billion people live in countries and regions defined as "water-scarce", and the situation is projected to worsen rapidly, with the number rising to 1.8 billion by 2025, partly as a result of population growth. Yet the benefits of irrigation are immense, with a productivity differential between irrigated and rainfed areas of about 130 percent. Over the past decade, irrigation alone accounted for about 0.2 percent out of overall annual yield growth for cereals of 1.1 percent. Experts estimate that at present in developing countries, irrigated agriculture, with about 20 percent of all arable land, accounts for 47 percent of all crop production and almost 60 percent of cereal production.

The assessment of ultimate irrigation potential of the country made in 1972 has been revised, mainly on account of reassessment of groundwater potential by the Central Ground Water Board (CGWB) from 40 m ha to 64.05 m ha. The ultimate irrigation potential for minor surface water schemes was also revised from 15 m ha to 17.38 m ha. Consequently, the ultimate irrigation potential stands revised from 113.5 m ha to 139.9 m ha as per the details furnished in table below:

Table : Irrigation Potential (million hectare)
Ultimate Irrigation Potential (m ha)

Sector	Existing	Revised
i) Major & Medium Irrigation	58.46	58.46
ii) Minor Irrigation		
a) Surface water	15.00	17.38
b) Grounded water	40.00	64.05
	55.00	81.43
Total (i + ii)	**113.46**	**139.89**

Changes in information technology will help in a big way to improve agri-business and incomes of small farmers. Indian private companies and NGOs are global leaders in providing information to farmers, as a spinoff from India's meteoric rise as a world leader in ICTs.
E-Choupal has expanded access to internet in rural areas. Up to 6,400 internet kiosks were set up between 2000 and 2007 by ITC Limited, one of the largest agricultural exporters. It reaches about 4 million farmers growing a range of crops - soybean, coffee, wheat, rice, pulses or shrimp - in over 40,000 villages. They get free information in their language about local and global market prices, weather forecasts, farming practices and crop insurance. It serves as a purchase centre, cutting marketing costs and allowing farmers to obtain a bigger farm price. The M. S. Swaminathan Research Foundation established Knowledge Centers in Pondicherry in 1997. With the support of the Indian Space Research Organization, centers in each village are connected by satellite to a hub at Villianur. The women self-help groups use the centers' computers to manage their business accounts and coordinate their activities, using video links with the other villages.

The declining costs of ICTs are giving small farmers much greater access to information. Mobile phone coverage in India is expanding at breakneck speed. Nokia sold several lakhs of new mobile phone handsets, and new subscriptions are averaging 6 million a month, many in rural areas. Computers are now being linked through mobile phone networks to greatly expand the scope of information. By linking communication technologies to market exchanges in commercial centers, even small farmers can overcome the enormous informational asymmetries that limit their bargaining power in traditional supply chains. The revolution in mobile phones is helping the small farmers to get information about crop prices and input prices and other related information on agriculture.

A successful e-Agriculture project in the state of Odisha, India, demonstrates how technology can be used to address these issues and improve the livelihoods of small farmers. In just over one year, the e-Agriculture project helped 6,000 farmers increase their incomes as much as 300 percent, and created job opportunities for local entrepreneurs. These kinds of project must be run for the small farmers so that they can easily meet their needs and also they must be educated about the technological use in the farming sectors.

Conclusion

Improving irrigation-financing would entail upon making the Irrigation Departments autonomous and self-financing through increased water charges, improving collection rates and developing instruments to capture private sector investments in development and management. The thrust of the new strategy would be on integrated approach to irrigation performance and agricultural growth, where reforming both the irrigation system and the irrigated agriculture interface would be the primary vehicle for sustainable agricultural growth.
Regarding protection of agriculture in OECD countries, some suggest that developing countries also should protect their agriculture. However, a better option is to provide more rural and agricultural goods that are undersupplied by the market. Infrastructure development like roads, irrigation, communications etc. Returns are also high from investments in agricultural R&D, rural roads and other infrastructure and knowledge generation. The rural infrastructure will enable small and marginal farmers to compete with other famers in India as well as in other countries. Government should also give a focus on the technological development of the farmers so that the return must be sufficient and any of the farmers may not suffer the critical situation.

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