Book Review

Digital India for Agricultural and Rural Development: Scope and Limitations, Edited
    by Kamal R. Gupta and V.B. Angadi, Gaurang Publishing, 2019. Pp.xiv+249.

The Indian agriculture sector is at crossroads, facing a multitude of challenges.
The daunting task of achieving higher productivity levels to feed the escalating
population using increasingly constrained resources is a challenge in itself. Besides,
the sector needs to provide livelihood security to all sections of farmers. This is tough
because the marginal and small farmers are yet to benefit fully from the government
schemes and policies on agriculture. At a period when the government is pressing on
increasing farm income, the benefits cannot wait to reach these farmer categories. It
is under this scenario that the applications of digital technologies become important
in agriculture.

The book starts with the scope and limitations of digital technology applications
for agriculture and rural development. It wonderfully explains the digital technology
advancements and the need for incorporating those in the agricultural sector. Internet
of things (IoT) applications and its benefits in the context of small farmers are dealt
in briefly. IoT applications enable the researchers and farmers to improve the farm
performance supported by the data generated locally. Such data has great relevance to
enhance the output in Precision Farming and related novel agricultural practices. The
introductory chapter has the capacity to intrigue the readers on the subject. Most
chapters that followed are devoted to explaining how different digital technologies
can help improve the agriculture performance, except the ones that dealt with specific
cases on E-trading, Manipal Business Solutions, Amul and Block Chain Technology.

The chapter on E-trading of agricultural commodities has dealt in detail the
importance of E-trading for India, the E-trading platforms available at present, their
ground-level performance and the benefits to stakeholders. The Government of India
recognised the need for setting up of a pan-India electronic platform to carry out trade
in agricultural commodities. The programme is implemented in the name of National
Agricultural Market (eNAM), and it connects the existing APMC mandis to create a
unified national market for agricultural commodities. It is thus apt that a chapter is
devoted to the E-trading of agricultural commodities through the eNAM. The chapter
deliberates in detail the need for a unified agricultural market, the concept of E-
trading, variants of the currently available online platforms, objectives of eNAM,
ground-level facts on the functioning of eNAM and the benefits to the stakeholders.
The authors reiterate that the farmers of our country do not have access to adequate
market information. The middlemen continued to exploit them and the government
has attempted several policy measures to address this. eNAM is the latest among such

measures that target to ensure a fair price to farmers and prevent the cartelisation by the marketing agents. Rightly, the chapter discusses the Unified Market Platform (UMP) ahead of the eNAM. The UMP is an initiative of the ReMS, a joint venture between NCDEX and Karnataka government. It is the first E-trading platform attempted for agricultural commodities that provided online access to all participants of the APMC market of Karnataka holding a license issued by the state government. eNAM is also conceptualised similarly but implemented across the country. The ground level shreds of evidence provided by the authors indicated that the farmers and traders are now comfortable to deal with the computers for trading, and they exercise their bargaining powers. The quality consciousness and transparency have improved, and the sellers participate in E-auctions irrespective of the proximity to mandis. However, the grading, sorting and quality assaying facilities need to be improved quickly to win the confidence of the farmers and traders.

After the very important case of eNAM, the book moves to a broader discussion on the challenges faced by the Indian agriculture sector and how can the digital technologies contribute to overcoming those. This broad topic is covered through chapters three, four, five, eight, eleven, fourteen and fifteen. The issue of sustainability in agricultural production in future, constrained resources, climate change impacts, and food security of the increasing population are the key challenges to be dealt with by the agriculture sector. The authors attempt to take us through the journey of technology development in Indian agriculture, and the barriers to technology adoption, which is interesting. The contribution of GM technology in enhancing cotton production is highlighted. The chapter on IT-driven sustainable agripreneurial ventures tries to take the educated, young section of the Indian farmers into confidence. The author reiterates that digital agriculture has the potential to enhance the performance of the agriculture sector. Precision agriculture is also dealt in detail along with the contribution of digital technology in functioning of precision farms, and its different cases. The potential of disruptive technologies in efficiency improvement of farms is highlighted. The role of digital technologies in rural development is discussed in chapter eight by calling attention to the "Digital India" programme of the government of India. The nine pillars identified by the government as growth areas for rural development are detailed. The discussion is continued in chapter nine, as a case study of Manipal Business Solutions (MBS). MBS utilise ICT infrastructure to take services to rural India. It is a great initiative that has brought the benefit of digital payments, banking services and value-added services to the proximity of the rural population.

A mention of different applications of digital India is given along with the status of the operation. Another key aspect covered in the book is the need for knowledge revolution for agriculture. It highlights the importance of creating awareness among the farmers on digital technologies and their applications on agriculture. The application of artificial intelligence for plant stress identification, image-based insight generation, and improving agricultural accuracy is explained. IoT is a highly

promising family of technologies which is capable of offering many solutions towards modernisation of agriculture. The book devotes three chapters to emphasise the importance of IoT in future agriculture in India. Examples of utilisation of IoT on agricultural monitoring and control, controlled environment agriculture, open field agriculture, livestock, and tracking the food supply chain is mentioned. The depiction of the structure of IoT for agriculture is very interesting and throws light on the different elements of IoT. The importance of integration of IoT with cloud computing, which has a powerful storage, processing and service capability is rightly pointed out. The different international cases of IoT applications in agriculture discussed act as a motivator for such ventures in India. Big data analysis is the term used to describe a new generation of practices designed so that farmers and related organisations can extract the economic value from large volumes of a wide variety of data by enabling high-velocity capture, discovery and analysis. However large infrastructure for data storage and processing analysis needs to be generated for reaping the benefits of big data. It can contribute to effective weather forecasting, pest and disease monitoring etc.

Blockchain technology (BCT) is another digital technology application quoted in the book to support future agriculture. BCT is a distributed ledger technology that empowers anyone with an internet connection to transfer anything of value-anywhere, anytime, with unmatched security and integrity. BCT can enable precision decision making among the farmers which in turn will improve efficiency. As the authors suggest, BCT can be utilised for better financing, smart farm contracts, land ownership records, transparent transactions, as well as for monitoring real-time data. A list of start-ups operating in India that uses BCT in various agricultural services is also given, and a glance through it apprise that BCT has the potential to begin a new era of development in the agriculture sector.

Digital technology cannot wait to contribute to the benefit of the agriculture sector, and that is the key message that the book unveil. It is felt that the book could have been structured in a better way, and the repetitive description of some of the topics be avoided. Still, considering the diversity of the topics covered and the subject expertise of the authors contributing, the book is suggested as a fine read to understand the basics of the necessity of digital interference in agriculture. This book is a good read for agricultural professionals and farmers considering its wide coverage and quality content. The book could be an initial reference for enterprising, educated and young professionals who would like to contribute to society through digital applications in agriculture.

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