



## **An effective e-commerce application framework for small, medium agri-enterprises and start-ups**

**V V Sumanth Kumar, Guntukogula Pattabhi Sandeep, Sallagundla Nikhil and M. Aruna Safali**

ICAR-National Academy of Agricultural Research Management (NAARM), Rajendranagar, Hyderabad-500 030

### **ABSTRACT**

Agribusiness integrates agriculture and commerce to meet consumer demands sustainably while maximizing profitability. Despite progress in agricultural marketing, a gap persists in catering to the evolving needs of rural and urban stakeholders. Rapid improvements in rural Information and Communication Technology (ICT) infrastructure, led by initiatives like BharatNet, are expanding internet connectivity to gram panchayats, offering millions of farmers digital access. This transformation provides opportunities to restructure agricultural extension and e-commerce systems. Agritech startups have emerged as crucial players in addressing farmer challenges; however, financial and technical barriers continue to hinder small and medium agri-entrepreneurs. The adoption of low-cost, user-friendly platforms like WordPress and WooCommerce presents a viable solution. WordPress, a widely used content management system, combined with the WooCommerce plugin, offers secure, customizable, and accessible features, enabling agri-entrepreneurs to establish online stores without significant investments or technical expertise. This study examines the implementation of WordPress-WooCommerce-based e-commerce solutions in capacity-building programs at ICAR-NAARM, Hyderabad, aimed at empowering agri-startups and small enterprises. Case examples such as Telangana-based Govada Foods and other e-commerce stores developed for NAARM participants illustrate the potential to enhance market access, reduce operational costs, and bridge the producer-consumer gap. A structured questionnaire was administered to 61 Post Graduate Diploma in Management (PGDM) students to analyze perceptions towards key dimensions, including ease of website building and management, design flexibility, scalability for business growth, and support for innovation. The results revealed that most respondents found the platforms moderately easy to use, expressed high satisfaction with design flexibility, and held positive views on scalability and innovation support. The findings advocate for promoting open-source e-commerce applications to empower agri-entrepreneurs, strengthen food supply chains, and drive sustainable agricultural development in India.

**Keywords:** *Agribusiness, Agri-entrepreneurs, E-commerce, Sustainable agriculture and WordPress-Woo Commerce*

Burgeoning population and food demand pressurizing the agricultural lands and the markets to supply the requirements of individual in the backdrop where Indian population has attained 140 crores in 2022 (as per the *Worldometer*, UN data) and is about to cross the Chinese population (144 crores in 2022) in the upcoming years. There comes a pivotal role of agribusiness to meet the needs of both rural and urban sectors. Agricultural marketing and trade scenario has undergone tremendous changes in recent years, however, it has not changed enough to meet the

emerging demand for such services and to cater the needs of farmers of India. Agri business is a combination of agriculture and business refers to the enterprises/industry/system that are interrelated to farm activities in order to maximize the profit while sustainably satisfying the needs of the customers for products such as biotechnology, farms, food, forestry, fisheries, fuel, and fiber. Agriculture sector has reached a value of INR 63,506 billion in 2020 and also projected to reach INR 1,25,350 in 2026 (IMARC Group),

exhibiting a compound annual growth rate (CAGR) of 12% during 2021-2026. These insights show that agriculture e-marketing is a major market contributor and vital for achieving sustainability in food systems in India by timely supply of inputs to farmers and produce to the end consumers in an effective manner. Over the last twenty years, IT has been the bedrock of innovations in most sectors be it Finance, Banking, Telecommunications, Transportation, Automotive etc. However, Agriculture is yet to see such a trend and these innovations can possibly emerge at the intersection of Agriculture, Finance, IT, IOT and BI. The main challenge for this to happen is ICT Infrastructure in rural India.

### **ICT Infrastructure in Rural India**

Improvement in ICT infrastructure is very rapid in rural India and many of the farmers access information in smart devices. There is an estimate that 3 Crores of farmers does have smart mobiles out of a total of 12 crore of farmers in India and this number is increasing aggressively. Bharat net (Bharat Broadband Network Limited) providing internet facilities to almost 2.5 lakhs of gram panchayats in India under the set up provided by the Department of Telecommunications under the Ministry of Communications of the Government of India. The length of OFC laid is 5,70,115 km. The number of GPS where OFC laid is 1,83,306 and the GPs to which OFC connected & equipment installed is about 1,77,015. As per the recent data of Bharat Net Usage Status as on 21-03-2022 *Wi-Fi Hotspot GPs*: Installed: 1,04,288; Active: 53,353 *FTTH Connections*: Commissioned: 2,14,174; Dark Fibre (KM): 37294.04; *Usage (Wi-Fi/FTTH)*: Bandwidth: 4,038.744 (Gbps); Data Consumption (Feb-2022): 4028.87(TB). It works in the proper channel i.e. Manufacturer- distributor- dealer- farmer. In next 2 years, it is expected that about 75% of farmers will have a smart mobile and access free hi-speed internet connectivity of BBNL at Gram Panchayat level. This scenario having smart mobiles with free of cost access to hi-speed internet connectivity, will re-structure the system of extension, information service and agri-business that is happening currently in India. E-commerce is the core of any business with no exception to agriculture. While the government of India counted almost 12 crores of farmers in the country, about 3 crores among them have a smart phone facilities. Small, medium agro enterprises and

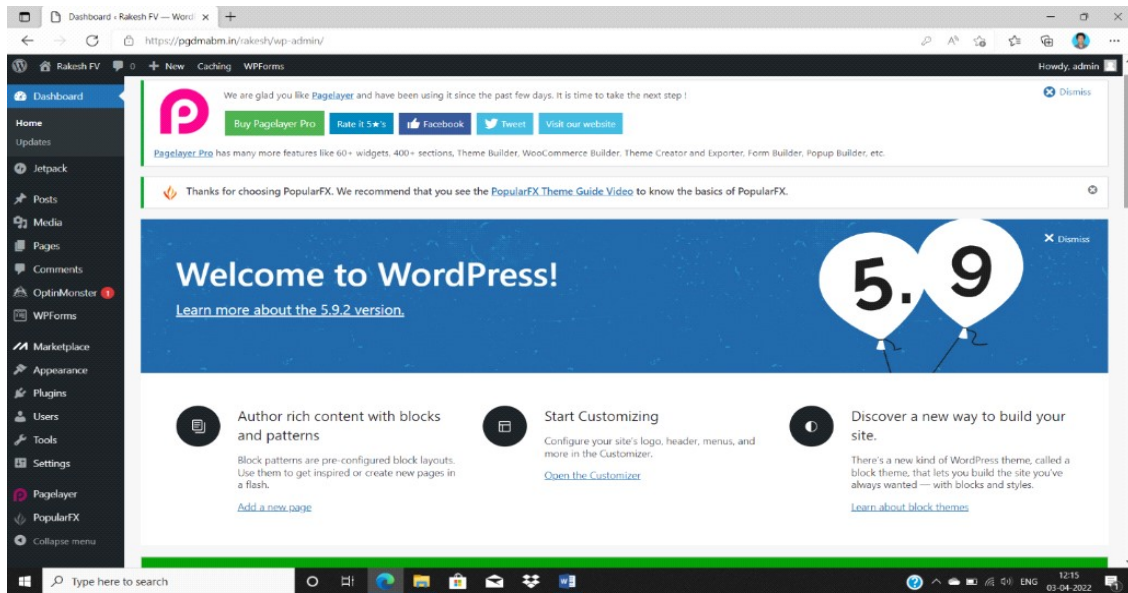
agri-startups will play critical role in near future in agri business domain of India (Dutta, 2018).

### **Startups in India**

Since there are very passionate agri-entrepreneurs in India, they play a critical role in addressing several challenges. They understand and meet the society's multiple needs and issues faced by the common man as they have excellent leadership and solution-oriented startups that enormously contribute to the Indian economy. However, there are multiple challenges in front of them, among all, finance is the key problem for every individual. There are almost 300 most valuable startups in India like BigBasket, Zomato, OYO, Paytm, Ola, Groww etc. are playing crucial role in Indian economy. *India has the 3<sup>rd</sup> largest startup ecosystem after China and the USA*. In recent times, India has seen a rise in the number of agritech startups which are effectively helping farmers to improve their lives. There are 10 most popular agri-startups in India viz., Ninjacart, WayCool, AgroStar, DeHaat, Stellapps, Bijak, CropIn Technology, EM3 AgriServices, Intello Labs, Aibono. These startups have raised millions of dollars with massive funding facilities. However, the small and medium agri-entrepreneurs or agri-domain people face several issues to build their own e-commerce websites as they have less financial resources initially. Therefore, there is a great necessity of building low cost yet robust e-commerce applications in agri business for the small and medium agri-entrepreneurs to widely enable the channel of producer and consumer in India. There are big e-commerce markets such as bigbasket-own soft, Grofers, Godrej nature's basket, amazon fresh etc. However, enabling this facility to the small and medium agri-entrepreneurs and the startups through the small, cheap and robust applications plays a critical role in transforming the food supply chain in agri-business. To meet this requirement, the Wordpress and WooCommerce ecosystem has been identified and implemented by academy as these are free applications, robust and secure.

### **WordPress and WooCommerce**

"WordPress" is an effective, easily accessible and flexible e-commerce application that helps in building our own content/blogs (fig 1) launched in 2003. The recent version 5.9.2 has more improvements and updates (WordPress). It is build under the plugin of Woocommerce (designed for small

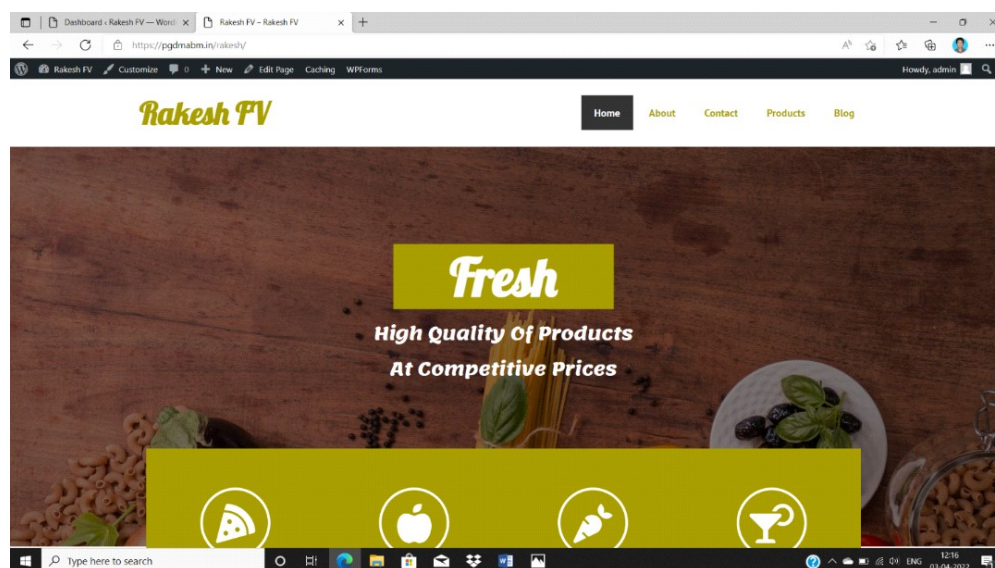


**Fig 1. WordPress Website**

to large sized online merchants). It became popular quickly because of its simplicity to install and customization. There are over 30 per cent of websites are WordPress in 2021 and currently about 455 million sites that use WordPress. As per the latest statistics, WordPress accounts for about 39.5 per cent of the entire Web and 62 per cent of CMS-built websites. WooCommerce is an ecommerce plugin for WordPress which swept the market and soon topped the online store builder charts with a 23.43 per cent market share in 2021. It makes creating and managing an online store simple, with reasonable levels of flexibility and several vital features such as inventory and tax management, secure payments, and shipping

integration. This combination is very simple, effective and transparent.

The “Govada foods” which is Telangana based organic store that selling a great range of products from local Farmer/suppliers all over India and the International suppliers. Also the “SWASA” startup is innovated & developed by E-Spin Nanotech Private Limited at SIDBI Incubation, IIT Kanpur selling health home groceries, palm/areca leaf plates and bowls and cold pressed oils through their own blog. The quickly developed Website using WordPress has showed in the Fig. 2 and it took less than 5 minutes to create initial website which need to be customized for making it live to the public.



**Fig 2. Own e-commerce site was created to confirm the ease of creation**

## MATERIAL AND METHODS

A structured questionnaire was administered to 61 Post Graduate Diploma in Management (PGDM) students to analyze perceptions towards key dimensions. The instrument was designed based on five key dimensions identified through a review of relevant literature and preliminary discussions with domain experts: (i) ease of building the e-commerce website, (ii) appearance and design flexibility, (iii) ease of managing the e-commerce website, (iv) scalability for business growth, and (v) support for innovation. For each dimension, a series of statements were formulated to comprehensively capture the respondents' experiences and opinions. Responses were recorded on a five-point Likert scale, where 1 indicated "Strongly Disagree" and 5 indicated "Strongly Agree." The structured questionnaire was administered to a sample of 61 students enrolled in the Post Graduate Diploma in Management (PGDM) program to measure their perceptions towards the use of e-commerce applications in the effective management of Small and Medium Agri-Enterprises and Start-ups. This scaling approach allowed for the measurement of varying degrees of agreement and provided quantitative data suitable for statistical analysis. To categorize the overall perception levels into "Low," "Medium," and "High," based on the mean and standard deviation.

## RESULTS AND DISCUSSION

The National Academy of Agriculture Research Management (NAARM), Hyderabad also introducing and creating awareness on these open source e-commerce applications in order to sensitize the small, medium agro-enterprises and startups to implement open source and robust Wordpress-WooCommerce e-commerce framework. Academy is working rigorously for knowledge transfer on developing the own e-commerce systems for agribusiness and startups at minimal cost without compromising in features and security. The identified e-commerce ecosystem was shown and explained in focused group discussion (FGD) in heterogeneous programmes of the academy like Foundation Course for Agricultural Research Services (FOCARS) through the group discussions and also to the Post Graduate Diploma in Management (Agri Business Management) PGDM-ABM students and agro-enterprises in capacity building programs (CBP)

organized at the academy and the Startups of a-IDEA (Incubator at ICAR-NAARM). Majority of the people felt that it is an effective solution, specifically for the small and medium agri-enterprises and startups who generally have less financial resources. Also we have implemented e-commerce stores for 111 focars group which was very effective during COVID times where no participant was permitted to go outside (Fig 3 & 4).

WordPress is a widely used platform that offers numerous benefits, making it ideal for website creation and management. One of its greatest advantages is that it is completely free to use, which makes it accessible to individuals, small businesses, and large organizations alike. The platform is user-friendly and features an easy update process, allowing users to quickly implement new features, security patches, and improvements without any technical hassle. Another key benefit of WordPress is its vast library of plugins, which enable users to add virtually any functionality to their websites, from SEO optimization and e-commerce capabilities to social media integration and advanced analytics. The platform also simplifies content creation and management, allowing users to easily add, edit, or update their website content without requiring advanced technical skills. Moreover, WordPress provides an extensive selection of themes, both free and premium, catering to various design preferences and needs. These themes allow users to customize their website's appearance and ensure it aligns with their personal style or brand identity. Combined, these features make WordPress a powerful, flexible, and accessible tool for building and maintaining websites of all types.

WooCommerce is a highly versatile platform that offers numerous advantages for creating and managing online stores. Its flexibility stands out, providing limitless customization options that allow users to tailor their e-commerce sites to meet specific needs and preferences. The platform is designed with a professional aesthetic and is seamlessly integrated with WordPress, making it a perfect choice for WordPress users. Security is a priority with WooCommerce, offering robust measures to safeguard transactions and customer data, although maintaining maximum security may involve some additional expenses. Another notable benefit is that users retain full control over their data, ensuring

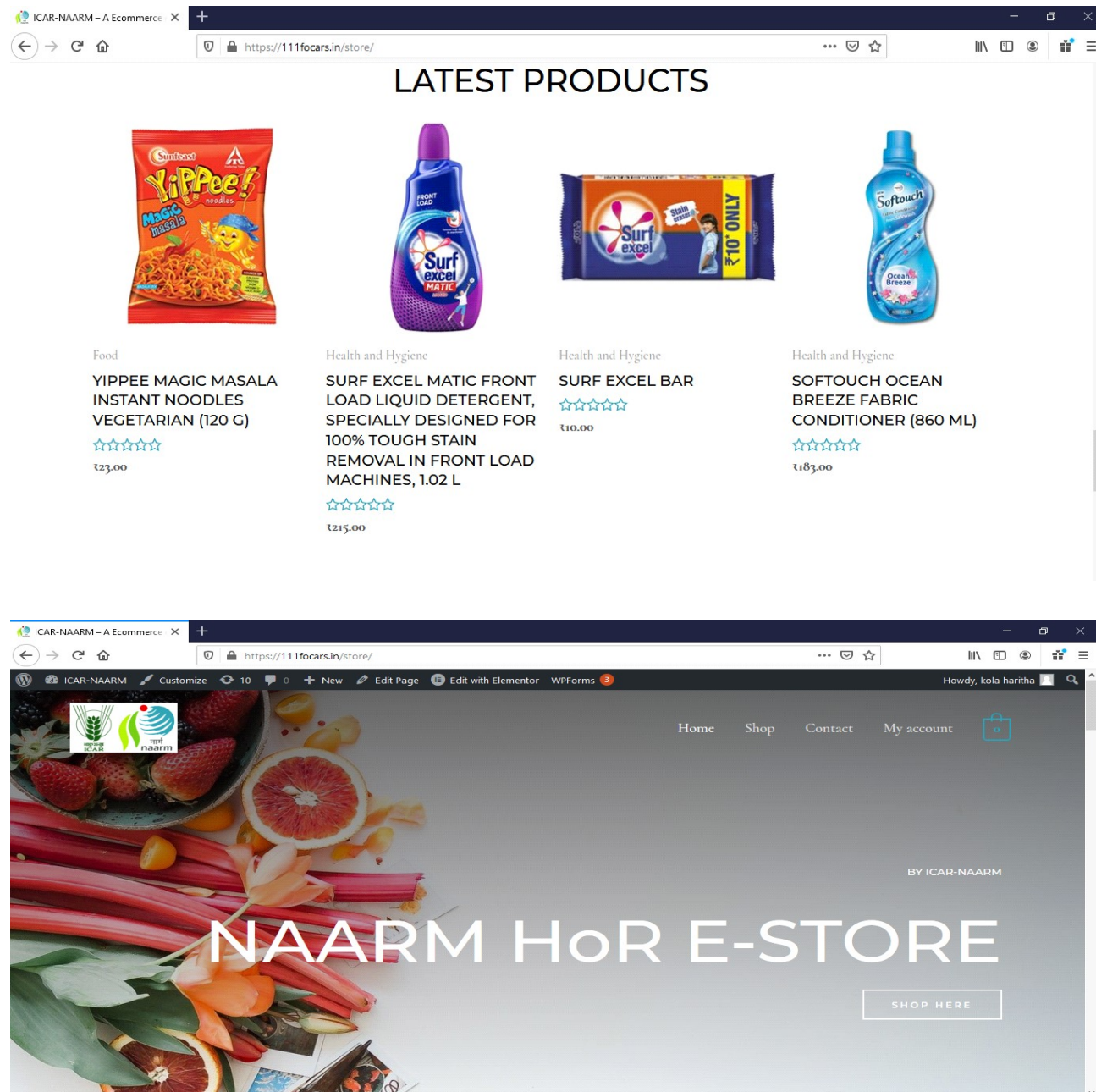


Image 3 & 4: E-commerce store implemented for 111<sup>th</sup> Foundation Course Participants

greater privacy and autonomy compared to many other e-commerce platforms. WooCommerce also delivers exceptional performance, with fast loading speeds that enhance user experience and reduce cart abandonment rates. As an open-source platform, it supports selling a wide range of products, from physical goods to digital downloads, making it a powerful and adaptable solution for e-commerce businesses of all sizes.

The perceptions of respondents towards e-commerce applications in the effective management of Small and Medium Agri-Enterprises and Start-ups were analyzed and are presented in Table 1.

***Ease of Building the E-Commerce Website:*** It was observed that a majority of the respondents (47.50%) perceived the process of building an e-commerce website as requiring moderate effort. About 31.10% of the respondents found it effortless, while 21.30% reported that it required high effort. This indicates that although some challenges persist, a significant proportion found website creation to be reasonably manageable, likely owing to the availability of user-friendly website builders and templates.

***Appearance and Design Flexibility:*** In terms of appearance and design flexibility, 49.20%

**Table 1. Perception of respondents towards e-commerce applications in effective management of Small, Medium Agri-Enterprises and Start-ups (n = 61)**

S.No	Particulars	Category	Frequency	Percentage
1	Ease of Building the E-Commerce Website (Mean – 20.79, SD – 2.94)	High effort	13	21.3
		Moderate effort	29	47.5
		Effortless	19	31.1
2	Appearance and Design Flexibility (Mean – 20.87, SD-2.19)	Good	9	14.8
		Better	30	49.2
		Best	22	36.1
3	Ease of Managing the E-Commerce Website (Mean -20.39, SD- 2.15)	High effort	18	29.5
		Moderate effort	24	39.3
		Effortless	19	31.1
4	Scalability for business growth (Mean -20.15, SD- 2.67)	Low	13	21.3
		Medium	30	49.2
		High	18	29.5
5	Support for Innovation (Mean -20.48, SD- 2.38)	Low	18	29.5
		Medium	24	39.3
		High	19	31.3
6	Total (Mean -102.67, SD- 10.31)	Low	14	23
		Medium	27	44.3
		High	20	32.8

of the respondents rated it as better, while 36.10% rated it as best. Only 14.80% felt it was merely good.

These findings suggest that most respondents are satisfied with the customization and design options available, which are crucial factors for customer engagement and branding in online businesses.

**Ease of Managing the E-Commerce Website:** Management of the e-commerce platform was perceived to require moderate effort by 39.30% of respondents, while 31.10% found it effortless. However, 29.50% indicated that managing the site required high effort. The results highlight that while management is relatively straightforward for many, there remains a need for training and capacity-building among agri-entrepreneurs to further simplify operations.

**Scalability for Business Growth:** Half of the respondents (49.20%) perceived the scalability of e-commerce platforms as medium, indicating that while some expansion is possible, limitations still exist. Meanwhile, 29.50% perceived high scalability, and 21.30% perceived low scalability. This suggests that while e-commerce provides a platform for growth, the extent of scalability may depend on additional

factors such as digital marketing skills, logistics support, and market access.

**Support for Innovation:** When assessing support for innovation, 39.30% of respondents rated it as medium, while 31.30% rated it as high. About 29.50% considered it low. This implies that although e-commerce facilitates innovation to some extent, there is a need to strengthen supportive ecosystems such as mentorship, financial services, and digital infrastructure to encourage more innovative business models.

**Overall Perception:** Overall, 44.30% of the respondents had a medium perception of e-commerce applications, 32.80% held a high perception, and 23.00% had a low perception. These results demonstrate a generally positive outlook among small and medium agri-entrepreneurs and start-ups towards the adoption of e-commerce, although barriers related to technical skills, platform management, and scaling opportunities remain to be addressed.

## CONCLUSION

Present digitalized generation needs hassle free e-commerce experience because of lack of time

and stressful life. Most of the young agri-entrepreneurs suffer from various marketing issues specifically due to lack of an effective e-commerce platform. Startups are passionate about their work as they understand and meet the society's multiple needs with their excellent innovations and solution-oriented startups and at the same time they are unable to build connectivity with farmers. WordPress combined with WooCommerce ecosystem would be an effective e-commerce solution for small, medium agri-enterprise and start-ups for establishing good accessibility to their stakeholders. Because of its easy implementation, free access and flexible application facilities, it needs no training or education for developing their own website for startups. Promotion of such open source e-commerce applications is a need of the hour to bring sustainability in food production channel in India.

#### LITERATURE CITED

- Worldometer. (n.d.). World Population Statistics. Retrieved December 9, 2024,** from <https://www.worldometers.info/world-population/>
- Bharat Broadband Network Limited. (n.d.). Retrieved December 9, 2024,** from <https://bbnl.nic.in>
- Dutt, S. (2018).** For India's farmers, it's agtech startups—not government—that is key. Forbes. Retrieved December 9, 2024, from <https://www.forbes.com/sites/suparnadutt/2018/01/08/for-indias-farmers-its-agtech-startups-not-government-that-is-key/?sh=18997ed91c6e>
- WordPress. (n.d.). Learn WordPress. Retrieved December 9, 2024,** from <https://learn.wordpress.org/>

Received on 10.04.2025 and Accepted on 15.05.2025