The Pharma Innovation Journal 2023; SP-12(12): 301-308

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(12): 301-308
© 2023 TPI
www.thepharmajournal.com
Received: 14-10-2023
Accepted: 19-11-2023

Sarvesh Kumar
Scientist (Agril. Extn. & Rural Sociology), JNKVV, Krishi Vigyan Kendra, Harda, Madhya Pradesh, India

Satish Kumar Samdariya
YP II (PME Cell), ICAR-ATARI, Zone-IX, Jabalpur, Madhya Pradesh, India

MK Bankoliya
PA (Plant Protection), JNKVV, Krishi Vigyan Kendra, Harda, Madhya Pradesh, India

Poonam Samdariya
Assistant Director Agriculture, Agriculture & Farmers Welfare Govt. of MP, Katni, Madhya Pradesh, India

Corresponding Author:
Sarvesh Kumar
Scientist (Agril. Extn. & Rural Sociology), JNKVV, Krishi Vigyan Kendra, Harda, Madhya Pradesh, India

Futuristic extension role of Krishi Vigyan Kendras and secondary agriculture for doubling farmer's income

Sarvesh Kumar, Satish Kumar Samdariya, MK Bankoliya and Poonam Samdariya

Abstract
Secondary agriculture is the present need of Indian agriculture. The many technological advances have evolved in our country to strengthen the secondary agriculture since independence but still a big part of agricultural and horticultural produces is get spoiled due to miss management of produces after harvesting. The food processing and handling, storage facility and value addition is the major efforts that can save a large quantity of produces from its spoilage and litter off. At the present junction of time Indian agriculture is transforming at very high level and faster rate. New technologies are coming day by day which are able to save raw materials and produces. Cold storage for perishable fruits and vegetables are also playing very important role by which a large part of perishables can be saved and store for long time and these are also help in transportation of the produces from one place to another place without big damage. The secondary agriculture imparts a huge part in growth of Indian economy. The Krishi vigyan Kendras (KVKs) are playing very pivotal role in extension, popularization of innovative technologies related to secondary agriculture in all over country. In Madhya Pradesh there are 54 Krishi vigyan Kendras which are transferring the technologies for food processing, storage and value addition in different agro ecological situations of Madhya Pradesh. The major crops are covered under secondary agri-horticulture are wheat, paddy, soybean, chickpea, green gram, sugarcane, millets, potato, chili, tomato, potato, mango, guava, loquat, pomegranate, custard apple pigeon pea and onion. These crops are being processed and value added in Madhya Pradesh. The major value added products are as pickles, papad, herbal drinks, processed millets, soya milk, tofu, soya biscuits, puffed wheat, oil extraction & filling, namkeen and laddoo, which are helpful in transforming state economy at faster rate.

Keywords: Secondary agriculture, PMFME scheme, value addition, farmers income, perishables fruits & vegetable, employment generation

1. Introduction
Krishi Vigyan Kendras (KVKs) are an essential element of the agricultural extension services in India. The network of KVKs, established throughout the country, has played an important role in the "lab-to-land" transfer of new and innovative technologies. Krishi Vigyan Kendras help in the innovation, refinement and diffusion of technologies and knowledge to the different farming community found in different localities of the country. Krishi Vigyan Kendras act as an interface between researchers, entrepreneurs and farmers, thus, helps in the development of agricultural practices suitable for specific agro-climatic zones. Krishi Vigyan Kendras also encourages entrepreneurship among the rural workforce through various vocational/skill training programmes. Since Krishi Vigyan Kendras work at the grass-roots level, with each district having at least one KVK, it is critical for the evolution of Indian agricultural system with sustainability & profitability for the farmers. This communication provides an insight of KVKs along with its possible advancement and opportunities to handle the current as well as upcoming challenges in Agriculture sector (Balkrishna *et al.* 2021) [3].
The Indian agricultural system is under a lot of stress due to faster growing population including with sudden climate changing scenarios. The world food production needs to increase by 60 percent to meet the global food in 2050 (Hunter *et al.*, 2017) [7].
Krishi Vigyan Kendra (KVK) is the only institution at the district level in India for technological backstopping in agriculture and allied Secondary agriculture should be the prime focus of agricultural extension for value addition. Besides, farmer should be made an active.
The secondary agriculture can be of three major types as type one is denotes a value addition to primary agriculture production systems and the type B secondary agriculture denotes alternative enterprises like beekeeping, poultry, agri-tourism and off-farm enterprises.

Whereas the type C secondary agriculture represents enterprises that flourish on crop residues and waste materials of primary agriculture (Sarath, 2023) [12]. The secondary agriculture ensures the regular income of the farmers and also encourages agriculture-oriented industry. [Azad *et al*., 2021] [2]

The adoption of new dimensions and technologies, innovation is possible through KVKs. The literature also reveals that adoption of improved technologies is the key to increase agricultural productivity and farmers' income (Matushcke *et al.* 2007; Subramanian and Qaim 2009; Duflo *et al.* 2011; Mason and Smale 2013; Kumar *et al.* 2020) [10, 16, 5, 9, 8]

Table 1: Host Institution-wise Distribution of KVKs in India

S. No	Name of Host Organization/Institution	KVKs
1	State Agricultural University	472
2	Central Agricultural University	22
3	ICAR Institutes	66
4	Non-government Organization	104
5	Public Sector Undertaking	3
6	State Govt.	38
7	Central University	3
8	Deemed University	8
9	Other Educational Institution	5
	Total (Till July 2020)	721

Source: Indian Council of Agricultural Research, Agricultural Extension Division, New Delhi-2023

Table 2: Host Institution-wise Distribution of KVKs in Madhya Pradesh

S. No	Name of Host Organization/Institution	No. of KVKs
1	Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (MP)	22
2	Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior (MP)	22
3	Indira Gandhi National Tribal University, Amarkantak (MP)	1
4	ICAR-Central Institute of Agricultural Engineering, Bhopal (MP)	1
5	Deen Dayal Research Institute, Chitrakoot, Satna (MP)	1
6	Kasturba Gandhi National Memorial Trust, Indore (MP)	1
7	Lok mata Devi Ahilyabai Holkar Social National Mission, Burhanpur (MP)	
8	Kalukheda Shikhcha Samiti, Jaora, Ratlam (MP)	1
9	Deen dayal Krishi Vikas Awam Anusandhan Samiti (DKVAAS) Bhopal (MP)	1
10	Centre for Rural Development and Environment, Sehore (MP)	1
11	Shri Malwa Mahila Vikas Samiti, Sironj, Vidisha (sub-judice) (MP)	1
12	Bhausahab Bhuskute Smriti Lok Nyas Sansthan, Bankhedi, Narmadapurum (MP)	1
Total KVKs (Till September 2023)		54

Source: ICAR-ATARI, Zone-IX, Jabalpur (Madhya Pradesh) 2022-23.

2. The Salient Meaning of Secondary Agriculture

The secondary agriculture comprises of the manufacturing or it can be termed as the process which adds value to the raw material of the processed product obtained from the primary agriculture and optimal usage of produce from primary agriculture and farm incomes [14].

The secondary agriculture realizes better productivity, profitability and sustainable production systems that would help to solve the fuel, feed and energy crisis, create more employment avenues, ensure regular income and encourage agriculture-oriented industry (Azad, *et al.*, 2021) [2]. Secondary Agriculture may also be recognized as an enterprise through production activity and inducing farm income by better extension services [4].

3. Background Scope and Objective of the Study

The running existing extension system has proved and played very pivotal role in vibrant growth of Indian agriculture from hand to mouth situation to self-sufficiency in all types of the livelihood needs including bread, clothes and houses since independence. This study will show as path to recentralize our energy and direction to move faster the rural based economy to become the world leader in all the needful livelihood aspects. The rural economy is to be revitalize through village to urban setting is very important which is possible through new extension strategies and dimensions which may be fulfilled through attracting rural youth towards agricultural based enterprises establishment and their dedication for nation building via secondary agricultural specially, because a lot of potential is to be exhausted from this field in generating income and employment for farming households in village areas. By keeping in mind the above mentioned facts and background the present study was laid down to analyze the economic betterment and doubling of the farmer's income through extension efforts of KVK in the field of secondary agriculture in Harda district of Madhya Pradesh.

4. Research Methodology

Present conceptual study was conducted to know the present extension needs and scope of secondary agriculture as backbone for rural economy in Harda district of Madhya Pradesh. In Harda district the secondary agriculture helps in generating income and employment for unemployed rural youth and other farming households in village areas. In such type of system, inputs were manufactured in rural areas thus resulting in movement of goods or products from rural to urban areas and the money movement from urban to rural areas which were found excellent for rural livelihood security. The major secondary agricultural based enterprise were studied for generating inferences of extension efforts made by the KVK Harda during last five years since 2018-2023. Total three successful secondary agricultural based enterprise units were studies and their responses were collected through structured interview schedule. As per response received from

respondents data were analyzed by using useful statistical tools and presented in this study.

5. Major Finding and Discussion

It is very important to understand the basic classification of the secondary agriculture and their use by the farmers and rural youth. Many of the farmers and unemployed rural are being trainee and motivated for adoption of Pradhan Mantri Formalization of Micro-food Processing Enterprises (PMFME) scheme Govt of India, Before going into the valuable facts and elaboration of success storey of rural youth who choose the secondary agriculture as their career or source of employment to become self-independent or self-reliant in field of secondary agriculture. Moreover the extension efforts of state department horticulture and food processing convergence with KVK Harda get successes to backstopping of the unemployed youth. Now these youth are doing well and have started their own business and also emerging as service provider for other people also including skilled and non-skilled laborers.

The different categories of the secondary agriculture is categorized into three categories given as under by many experts as per different stages of secondary products processing and their remuneration values for income generation

Category 1: Primary processing: The processing of the any produces deals with the work like Cleaning of the raw produces or materials, sorting of the materials or raw produces and finally processing work related to grading of the produce for making the product value higher for better income and consumer satisfaction.

Category 2: Secondary processing: The secondary processing work is deals with the all related basic processing of produce and packaging of the produces such as different dals (Chickpea dal, Greengram dal, Urdbean dal, Lentil dal, Pigeon pea dal and Kidney beans etc), rice (Basamati and Deshi), millets (Sorghum, Pearl millet, Maize, Kodo etc), wheat flours, suji, multigrain flours, wheat dalia, besan, different spices/spices powders (Chilli powder, Coriander powder, Coriander seeds, Amchur, Garlic, Ginger, Onion, Peanuts, Mint, Turmeric powder and Tamarind) etc. for enticing look and attraction towards the product with its certification, leveling, fssi registration numbers and packing and expiry dates information etc.

Category 3: Tertiary processing: The tertiary processing work is deals with the complex processing which is generally done in factories of mills, they are related to techniques such as, different kinds of snacks, chips, kurkure, noodle, macaroni, pasta, bread, toast, biscuits, cookies cakes, etc. with high quality certification, leveling, fssi registration numbers and packing and expiry dates information etc.

5.1 Major Secondary Agricultural based Enterprises of District Harda (MP)

- It is well established definition of secondary agriculture which is being accepted by many experts that any farm based or farm related activities that require the land or labour further than the kharif season, rabi season or summer seasons may considered under the secondary agriculture activity in different area. The major income generating activities related to secondary agriculture are being perceived in Harda district as follows
- The income generation activities based on the crop residues (Cleaning of fields) use of major cereal crops like making wheat straw from wheat leftover at the time of harvesting through harvesters, this activity is done with a adjustment used as straw making machine and it generate revenue @ Rs 800-1000 per trolley of 10 quintal straws. And the ready Wheat straw as dry fodder for animal is sold @ Rs 250-300 per quintal during the season. These rates of wheat straw fodder get changed as per demand and supply or availability with farmers and other wheat straw entrepreneur's time to time. This is a very big and easy profitable emerging business based on secondary processing being noticed in Harda district.
- The Chickpea straw/ residue also generated through harvesting and winnowing used for goatry, burning material for small industries/ brick kilns and for other animals like horses and sheep is used. The common rates of Chickpea residue are about Rs 300-350 per quintal. Farmers are selling this after winnowing process of Chickpea to make field clean and before starting the land preparation for summer crops cultivation.
- In case of fruits crops like Loquat, Papaya, Mandarin, Guava and Custard apple the sorting and grading is done regularly which gain generate work for labourers / contractors and in relation to vegetable crops like Tomato, Brinjal, Chilli and other vegetables crops the numerous people are getting work for their livelihood security in secondary agriculture.
- The warehousing facilities are also developed to provide storage, grading facilities, packaging etc which created a lot of work opportunities for locality people for their income and livelihood.
- There are many small scale/cottage scale units are being established in Harda district which are providing local opportunities to the suppliers of raw material, crop produces and labour work regularly as a part of secondary agriculture and horticulture for making the products like pickles, snacks, dal making, turmeric powder, red chilli powders, coconut oil, mustard oil, soybean oil, chips, coriander powder and many bamboo products in one district one product scheme etc.
- As a secondary agriculture the family workforce or manpower can be indulge in many income generation activities related to animal husbandry, dairy (Murrah, Sahibal, Gir, Jersey, Holstein Frisian), poultry (Kadaknath, Broiler, egg production), goat rearing (Barberry, Sirohi), sheep rearing to sustain income and livelihood security of the small farmers, marginal farmers and landless farmers or labourers respectively.
- Many other small scale farm level activities also may be performed by the farmers and other people such as establishment of vermi-compost units for manure production and selling in local areas for income generation, clay pot making, clay based crafts and statue making, mushroom production, back-yard poultry rearing, development of backyard nutria-garden, plant and vegetable nurseries etc.

5.2 Successful Cases of Entrepreneurship Development in Harda district

5.2.1 Entrepreneurship Development Details of Successful Case -1

Mr Pankaj Gurjar an energetic youth decided to shift himself into an entrepreneur, and he transformed his primary

agricultural activities to secondary agricultural based activities as per technical and legal guidance provided by state department of horticulture & food processing and Krishi vigyan Kendra-Harda. His father is a farmer doing his agriculture for a long time. He was suggested to establish his enterprise under PMFME scheme of Govt. of India. After a legal and technical exercise he was ready to start a dal mill for making and packaging of Kankut Dal as per his personal choice and availability of raw material at local areas in Harda district. He has started and now successfully manufacturing different kinds of dal like Greengram dal, Chickpea dal and Pigeon pea dal in his village itself.

Table 3: A View of Mr. Pankaj Gurjar with his Dal mill and Packed Product Items

S. No.	Name of different Items/ variables	Activities /Achievement details
1	Name of dal brand	Kankun Dal
2	Manufacturing capacity of dal mill	50-60 kg/hr
3	Packaging size of dal packets	1 Kg, 5 Kg, 10 Kg, 30 Kg
4	Employment generation	02 regular workers/day
5	Current marketing opportunities	Nearby Villages, local Markets/ Haats and district level
6	FSSAI Registration No.	21423130000229
7	Sanctioned total loan amount under PMFME scheme	Rs 3.15 Lakh
8	Subsidy received	Rs 1.22 Lakh
9	Current annual sale/business received	Rs 4-5 Lakh
10	Name of secondary agriculture based products manufactured	Greengram dal, Chickpea dal and Pigeon pea dal
11	Detail of Entrepreneur	Mr Pankaj Gurjar, Village- Jhadpa, Tehsil -Harda, District-Harda, Madhya Pradesh -461331

Sources: Deptt. of Horticulture & Food Processing, district-Harda, Govt. of MP-2023

Fig 1: A View of Mr. Pankaj Gurjar with his Dal mill and Packed Product Items

5.2.2 Entrepreneurship Development Detail of Successful Case -2

A rural youth Mr. Ramkrishna Rajput was started his work from small scale vender of locally manufactured spices in Harda district. He came in contact of department of Horticulture and scientists of Krishi Vigyan Kendra-Harda in the two years back. He was technically guided and suggested to upgrade his spice manufacturing and self-packaging and marketing. He was convinced and facilitate for sanctioning of loan under PMFME scheme of Govt of India. He started his valuable exercise and get success in getting advantage of this scheme in the year 2022-23, by which he established hiss spice manufacturing unit in his village. Now he is doing his spice business successfully with providing labour work to another 10 rural workers in his unit.

Table 4: A View of Mr. Ramkrishna Rajput with his Spice Unit and Packed & labeled Products

S. No.	Name of different Items/ variables	Activities /Achievement details
1	Name of Spice brand	Nirmal Mashala
2	Manufacturing capacity of spice unit	10-12 q/day
3	Packaging size of spice packets	50 gm, 100 gm, 200 gm, 500 gm
4	Employment generation	10 regular workers/day
5	Current marketing opportunities	Different districts of state Madhya Pradesh like Harda, Narmadapuram, Dewas, Betul, Sehore, Khandwa
6	FSSAI Registration No.	11423950000051
7	Udhyan Registration No.	4047528
8	Sanctioned total loan amount under PMFME scheme	64.56 Lakh
9	Subsidy received	Rs 1.22 Lakh
10	Current annual sale/business received	Rs 35-36 Lakh
	Detail of Entrepreneur	Mr Ramkrishna Rajput, Village- Samardha, Tehsil -Timarani, District-Harda, Madhya Pradesh -461331

Sources: Deptt. of Horticulture & Food Processing, district-Harda, Govt. of MP-2023

Fig 2: A View of Mr. Ramkrishna Rajput with his Spice Unit and Packed & labeled Products

5.2.3. Entrepreneurship Development Details of Successful Case -3

Another successful milestone was emerged in the field of edible oil production through natural process in Harda district. One of the successful entrepreneur names as Mr. Rishabh Sharma a rural youth is extracting different types of oil form locally available raw material under secondary agriculture. He has learned this skill from his parents who were the traditional oil extractor since long time. But due to the financial hindrances this work was about stopped few years back. Then, one day this rural youth came in contact with officers of horticulture and KVK scientists during different meetings, where he was informed for taking benefits of PMMFE scheme and again give backstopping to his edible oil business in his village itself. He was convinced and he started making efforts for this and in the year 2021 he established his new edible oil extracting unit separately. Now he has established himself as a successful entrepreneur and made his own brand as Rishabh Naturals. This brand is now very famous in local area with highest regular customers/ consumers in the district.

Table 5: A View of Mr. Rishabh Sharma with his Oil Extracting Unit and Packed & labeled Oil Products

S. No.	Name of different Items/ variables	Activities /Achievement details
1	Name of edible oil brand	Rishabh Naturals
2	Manufacturing capacity of oil unit	80 liter/day
3	Packaging size of spice packets	200 ml, 500 ml, 1liter, 5liter
4	Employment generation	03 regular workers/day
5	Current marketing opportunities	Whole district & MP State
6	FSSAI Registration No.	2141910000616
7	Udhyan Registration No.	210000330
8	Sanctioned total loan amount under PMFME scheme	Rs 2.47 Lakh
10	Current annual sale/business received	Rs 15-18 Lakh
11	Name of secondary agriculture based products manufactured	Kchchi Ghani Oil (Coconut oil, Mustard oil, Groundnut oil, Soybean oil)
12	Detail of Entrepreneur	Mr Rishabh Sharma, Village- Charuva, Tehsil -Khirkiya, District-Harda, Madhya Pradesh -461331

Sources: Deptt. of Horticulture & Food Processing, district-Harda, Govt. of MP-2023

Fig 3: A View of Mr. Rishabh Sharma with his Oil Extracting Unit and Packed & labeled Oil Products

5.3 Significance of Secondary Agriculture in Present India

The secondary agriculture is considered as the sunrise sector of Indian economy. It comprises of manufacturing or processes that increase the value of primary agriculture. Some of the avenues of secondary agriculture are nurseries, bio-pesticides, bio-fertilizers, agro-processing, fruit and vegetable processing, micro, small and medium enterprises, bee keeping, agro-tourism, by product utilization, waste utilization, etc. This sector has a great potential in providing employment opportunities to innumerable youth in the country. Value addition in these areas and their secondary products can provide two-four times higher incomes to the farmers. Therefore, goal of doubling farmers' income can be achieved by shifting into secondary agriculture. In India, there is a great scope of secondary agriculture due to immense quantity of production, adequate labour and facilities, shifting of people to value added and processed foods, assured market supply, consumer demand, etc. Thus, secondary agriculture implementation could be a boon to Indian economy, social status and environmental protection. This paper discusses about the aspects, importance and benefits of secondary agriculture, types and categorization of secondary agriculture enterprises and some of the developed secondary agriculture models. (Singh *et al*., 2021) [15]

5.4 Expected Benefits of Secondary Agriculture in Present and Future Situations

1. The secondary agriculture play very important role right from employment generation to income generation for Indian farming community.
2. The secondary agriculture helps in efficient utilization of farm based resources available in rural area for their reuse and income generation.
3. The secondary agriculture also has a bearing on climate change adaptation and its mitigation, small farm viability and profitability, food security, nutrition, sustainable utilization of natural resources.
4. The secondary sector deals with activities that produce finished products ready for consumption. The world economy now a day is totally depends on the secondary agriculture form field to feed population.
5. The secondary agriculture sector is the additional resources of income and employment opportunities enhancement in rural areas.
6. The secondary agriculture also goes together with various primary agricultural operations.
7. The secondary agriculture provides opportunities in efficient utilization of farm based resources available in rural area for their reuse and income generation.

8. The secondary agricultural related activities are helpful in shifting of agricultural capital from urban locality to rural areas continuously.

5.5 The Future Technology for Primary and Secondary Agriculture in India

Use of digital technology can make revolution in this primary and secondary agriculture in India. The futuristic technology will be use of satellites, Internet of Things (IoT), drones for better collection of data regarding soil health, crop area and yield which will make cost for insurers less with better estimations and system will be more exact and effective [7]. The genetic engineering, artificial intelligence, block chain, remote sensing, GIS technology, use of drones, Kisan Call Centers, Kisan Suvidha App, Agri Market Apps technology will be more in trend rather to present and personal.

5.6 The Importance of Technology in Primary and Secondary Agriculture

The modern innovative technology in agriculture can be used in different aspects of agriculture such as the application of herbicide, pesticide, fertilizer, and improved seed. Since independence period India has proved through may innovative technologies which makes the agriculcutural sector very profitable and strong by using biotechnology, Bt techniques in fruits and vegetable and droughts mitigation technologies. Through technology, farmers are in a position to electrify every process for efficiency and improved production and income [1].

5.7 How Secondary Agriculture Enhance Farmers' Income?

The secondary agriculture can help drive the growth of primary agriculture and three avenues have been identified that adequately help utilize capital, human resources, technology, organizational capabilities and risk management which may provide the income generating atmosphere to the farmers and agri-based entrepreneurial community. Value-addition to primary agriculture production systems can be achieved by improving livelihood enhancement action plans that are implemented by farmers like community-based organizations. Linking farmers with the market through aggregation and grading of agricultural produce can help them in value enhancement and appropriation. Collectivization, cluster farming, financial literacy, marketing skills are important to build this opportunity. Alternative enterprises associated with rural off-farm activities like bee keeping, poultry rearing, vermin compositing, backyard gardens and dairying etc. Integrated farming can hedge farm risk in the period of crop failure or ease out the seasonality in the stream of cash flows for farmers [13].

5.8 Role of Krishi Vigyan Kendras for Promotion of Secondary Agriculture

Krishi Vigyan Kendras act as an interface between researchers, entrepreneurs and farmers, thus, helps in the development of agricultural practices suitable for specific agro-climatic zones. Krishi Vigyan Kendras also encourages entrepreneurship among the rural workforce through various vocational/skill training programmes under secondary agriculture. The krishi vigyan Kendras (KVKs) are playing very pivotal role in extension, popularization of innovative technologies related to secondary agriculture in all over country. In Madhya Pradesh there are 54 krishi vigyan Kendras which are transferring the technologies for food processing, storage and value addition in different agro ecological situations of Madhya Pradesh. The major crops are covered under secondary agri-horticulture are wheat, paddy, soybean, chickpea, mung bean, sugarcane, millets, potato, chilli, tomato, potato, mango, guava, loquat, pomegranate, custard apple pigeon pea and onion. These crops are being processed and value added in Madhya Pradesh. The major value added products are as pickles, papad, herbal drinks, processed millets, soya milk, tofu, soya biscuits, puffed wheat, namkeen and laddoo. Which are helpful in transforming state economy at faster rate. The farmers are getting better opportunities to start new startups in Madhya Pradesh through value added products. The efforts made by KVKs in the area of secondary agriculture are being recognized by ICAR, New Delhi and State government time to time.

6. Conclusion

The secondary agriculture is the backbone of the Indian economy and its practice is providing golden opportunities to rural youth to create employment possibilities by grass root efforts of different KVKs in Madhya Pradesh. Secondary agriculture is basically entrepreneurship development method that helps in generating income and employment for farming household in village areas. To achieve the objective of sustainable development and doubling farmers' income, implementation of different alternative enterprises under secondary agriculture is most necessary. Through secondary agriculture, money can flow from urban areas to rural areas that help in development of rural households. The value-added products is increasing in the market, there is immense scope of secondary agriculture in the country. However, new policies and initiatives for encouraging value-addition of the agricultural produce in production catchment areas are required. Climate change and depleting agricultural resources will challenge the food and nutritional security of the county in the coming decades. Hence, the need of the hour is to make agriculture future-ready through the innovation use of various resources. KVKs will play a major role in this endeavour by being at the forefront of change through popularization of new technologies and digital connectivity with farming community. The KVKs are the crucial link between researchers and farmers for the translation of modern agricultural technologies to the farm including primary and secondary agriculture both. Similarly, through emphasis on secondary agriculture, KVKs will ensure more income for the farmers and help in doubling their income. The collective efforts from line departments, NGOs, FPOs, Commodity clusters and KVKs will move the Indian economy and income opportunity for the rural youth and farmers through secondary agriculture in India. Focus on secondary agriculture will also help to feed future mounting population of the country in sustainable manner.

7. References

1. Adoption of modern technology in agriculture https://www.drishtiias.com/daily-news-analysis/adoption-of-modern-technology-in-agriculture visited on 8 Sept, 2023
2. Azad A, Qayoom S, Bahar FA, Mehdi SS, Fayaz S, Iqbal S, *et al*. Secondary Agriculture towards Increasing Production and Sustainability, Asian Journal of Agricultural Extension, Economics & Sociology.

2021;39(10):175-189.
3. Kumar B, Brijesh, Arya V. Role of Krishi Vigyan Kendras in Strengthening Agriculture Extension in India. Biological Forum-An International Journal. 2021;13(2):688-694.
4. Best technologies for secondary agriculture https://www.google.com/search?q=best+technolgies+for+secondry+agriculture+in+india&rlz=1C1GCEK_enIN1062IN1062&oq=best+technolgies+for+secondry+agri&aqs=chrome.2.69i57j33i10i160l3j33i22i29i30l2j33i15i22i29i30.15058j0j15&sourceid=chrome&ie=UTF-8#imgrc=m8SWIkwtx1qHkM visited on 10 Sept, 2023
5. Duflo E, Kremer M, Robinson J. Nudging Farmers to Use Fertilizer: Theory and Experimental Evidence from Kenya, American Economic Re-view. 2011;101(6):2350-2390
6. Future of Indian agriculture https://www.downtoearth.org.in/blog/agriculture/the-future-of-indian-agriculture-75384 visited on 8 Sept, 2023
7. Hunter MC, Smith RG, Schipanski ME, Atwood LW, Mortensen DA. Agriculture in 2050: Recalibrating Targets for Sustainable Intensification. Bioscience. 2017;67:386-391.
8. Kumar A, Tripathi G, Joshi PK. Adoption and Impact of Modern Varieties of Paddy in India: Evidence from a Nationally Representative Field Survey, Journal of Agribusiness in Developing and Emerging Economies. 2020;11(3):255-279.
9. Mason NM, Smale M. Impacts of Subsidized Hybrid Seed on Indicators of Economic Well-Being among Smallholder Maize Growers in Zambia, Agricultural Economics. 2013;44(6):659-670
10. Matuschke I, Mishra RR, Qaim M. Adoption and Impact of Hybrid Wheat in India, World Development. 2007;35(8):1422-1435.
11. Role of Krishi Vigyan Kendra. https://mpra.ub.uni-muenchen.de/104339/ visited on 7 Sept, 2023
12. Sarath S. Boosting Secondary Agriculture. Article written by Assistant Professor, NITTE School of Management, Bengaluru in the The New Indian Express. https://www.newindianexpress.com/opinions/2023/aug/31/boosting-secondary-agriculture-2610156.html. Retrieved on 10 Sept, 2023
13. Secondary agriculture for doubling farmers income https://www.dhyeyaias.com/current-affairs/daily-current-affairs/does-secondary-agriculture-activities-have-potential-to-double-farmer-income visited on 7 Sept, 2023
14. Secondary agriculture shift in Indian farming https://www.financialexpress.com/opinion/secondary-agriculture-the-shift-indian-farming-needs/1807044/ visited on 8 Sept, 2023
15. Singh R, Mann S, Mittal S. Prospect of secondary agriculture in enhancing farmers' income, Indian Farming. 2021;71(11):64-67.
16. Subramanian A, Qaim M. Village-wide Effects of Agricultural Biotechnology: The Case of Bt Cotton in India, World Development. 2009;37(1):256-267.