International Journal of Advanced Biochemistry Research

ISSN Print: 2617-4693
ISSN Online: 2617-4707
NAAS Rating (2025): 5.29
IJABR 2025; 9(8): 347-350
www.biochemjournal.com
Received: 13-06-2025
Accepted: 16-07-2025

Sagar Chandaki
M.Sc. Scholar, Department of Agricultural Extension Education, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

PR Deshmukh
Professor, Department of Agricultural Extension Education, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

RP Kadam
Professor & Head, Department of Agricultural Extension Education, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

AS Lad
Assistant Professor, Department of Agricultural Extension Education, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

DS Perke
Associate Dean and Principal, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

Corresponding Author:
Sagar Chandaki
M.Sc. Scholar, Department of Agricultural Extension Education, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

Knowledge of dryland farmers about dryland technologies among farmers in Marathwada region of Maharashtra

Sagar Chandaki, PR Deshmukh, RP Kadam, AS Lad and DS Perke

DOI: https://www.doi.org/10.33545/26174693.2025.v9.i8e.5179

Abstract
The study was conducted to find out the knowledge and adoption of dryland farmers about dryland technologies among farmers in Marathwada region of Maharashtra. Total 120 respondents were randomly selected from 6 villages of 1 taluka of Parbhani district. Data were collected using a well-structured interview schedule. Data were analysed by using frequency, percentage, mean, Pearson's coefficient of correlation and standard deviation. The result was concluded that the majority of dryland farmers were middle aged farmers (60%), educated up to higher secondary school level(35.83%), medium size of family (65%), having marginal land holdings (40.83%), with medium level of annual income (87.50%), medium extension participation (52.50%) and belonged to medium level of social participation (75.00%).

It was observed that majority of respondents, 61.67 percent had medium level of knowledge about dryland technologies, followed by low, 26.67 percent and high, 11.67 percent level of knowledge. It is concluded that total knowledge of dryland technologies developed from VNMKV, Parbhani, are in medium range.

Keywords: Profile, knowledge, medium, dryland, dryland farmers

Introduction

Dry land agriculture is the practice of growing crops in arid, semi-arid, and sub-humid climates solely through rainfall. One type of subsistence farming in areas with insufficient rainfall is dry land agriculture. Through the use of diverse dry land farming technologies, high-yield and high-efficiency agricultural output can be achieved in areas without irrigation and that rely heavily on natural rainfall.

Based on the amount of rainfall received, dry land agriculture has been divided into three categories:

1) Dry farming: This is the practice of cultivating crops without irrigation in dry regions with less than 750 mm of annual rainfall and a growth season of less than 75 days. Due to extended dry spells during the crop cycle, crop failures are more common in dry farming. Potential transpiration and evaporation exceed typical rainfall. There are less than 200 days in the growth season.

2) Dry land farming: Growing crops in regions that get more than 750 mm but less than 1150 mm of rainfall. Crop failure is less common, however there are dry spells during the crop's lifespan. This category includes semi-arid locations.

3) Rainfed farming: Is the method of growing crops without irrigation in regions that receive more than 1150 mm of rainfall annually. There is relatively little possibility of crop failure and water stress here.

Crops can be grown without irrigation using three different agricultural techniques: rainfed farming, dry farming, and dry land farming. Rainfed agriculture, which comprises the majority of Indian agriculture, includes both dry farming and dry land agriculture. Rain-fed agriculture makes up around 65% of India's arable land, and the amount of each crop

produced is determined by the monsoon season. Nearly 75% of India's 143 million hectares of arable land are made up of 108 million hectares of rainfed land. Rainfed agriculture provides almost 40% of India's total food grain production, 75% of its oilseeds, and 90% of its pulses. Dry land agriculture accounts for about two-thirds of India's total cultivated area and generates nearly half of its total agricultural output value.

Maharashtra Dry land agriculture profile

India has nearly nearly 80 Million hectares of dry land area out of 141 Million hectares of total cultivable land area. Dry land constitutes about 52% of total cultivable land area. In Maharashtra nearly 83%-84% area under dry land agriculture only 16% area has irrigation facility in Maharshtra which cannot be increased to more than 25% of total crop area. Parbhani district comes under Marathwad region. District's more portion is covered by dry land area.

	Total cultivable land (lakh ha)	Dry land area(lakh ha)	Irrigated land area(lakh ha)
Maharashtra	225	184.42 (82.00%)	40.58 (18%)
Marathwad Region	57	48.9 (86.00%)	8.10 (14%)

Dryland agriculture in Maharashtra is a vital component of the state's agricultural sector, supporting the livelihoods of millions of farmers and rural communities. Despite facing numerous challenges, including climate change, water scarcity, and soil degradation, dryland agriculture in Maharashtra has tremendous potential for growth and development.

2. Materials and Methods

The present study was conducted randomly in the Parbhani district of the Marathwada region in Maharashtra, where a considerable number of dryland farmers are there. The objective was to study the knowledge and adoption of dryland farmers about dryland technologies among farmers in Marathwada region of Maharashtra. One taluka, Parbhani, is selected randomly from the district. From the taluka, six villages with a significant number of dryland farmers who were practicing dryland agriculture were randomly chosen. In each village, 20 dryland farmers who are practicing dryland agriculture were selected randomly, making a total of 120 respondents for the study. Two dependent variables Knowledge and Adoption and seven independent variables viz., age, education, size of family, land holding, annual income, extension participation and social participation were selected for the study. Data were collected from respondents using an interview schedule through personal interviews. The data were analyzed using frequency, percentage, mean, standard deviation.

2.1 Overall Knowledge of farmers about dryland technologies among farmers

Knowledge schedule was formed by Subject matter specialists of technologies developed by AICRP, VNMKV, Parbhani. A list of 26 technologies were selected for the purpose and each was administered in a question form to their respondents to obtain response. One point was awarded to right response and zero for a wrong one. This quantified the replies. Consequently, the highest possible score was 26, and the lowest possible score was 0.

The total number of questions that a respondent answered correctly was added up to determine their overall knowledge score.

After computing Knowledge level score, the respondents were grouped into low, medium and high knowledge categories based on the mean ± S.D as a indicator below.

Sr. No	Category	Score
1.	Low	Up to 7
2.	Medium	8 to 14
3.	High	15 & Above
	Mean	10.12
	S.D	3.49

3. Results and Discussion

3.1 Profile of dry land farmers

Table 1: Distribution of respondents according to their profile

Sr. No	Category	Frequency	Percentage
A. Age			
1	Young (Up to 30 years)	26	21.67
2	Middle (31 to 57 years)	72	60.00
3	Old (58 years & Above)	22	18.33
B. Education			
1	Illiterate	8	6.67
2	Literate (Can read and write)	9	7.50
3	Primary School	19	15.83
4	Seconadary	28	23.33
5	Higher sec. School	43	35.83
6	Graduation	13	10.83
C. Size of family			
1	Small (Up to 3)	26	21.67
2	Medium (4 to 7)	78	65.00
3	Large (8 & Above)	16	13.33
D. Land holding			
1	Marginal (upto 1.00 ha.)	49	40.83
2	Small (1.01 to 2.00 ha.)	48	40.00
3	Semi medium (2.01 to 4.00 ha.)	18	15.00
4	Medium (4.01 to 10.00 ha.)	3	2.50
5	Large (10.01 ha. and above)	2	1.67
E. Annual income			
1	Low (Up to Rs. 62, 000)	3	2.50
2	Medium (Rs 62, 001 to Rs 2, 52, 000)	105	87.50
3	High (Rs. 2, 52, 001 and above)	12	10.00
F. Extension participation			
1	Low (Up to 3)	42	35.00
2	Medium (4 to 6)	63	52.50
3	High (7 & above)	15	12.50
G. Social participation			
1	Low (Up to 1)	23	19.17
2	Medium (2 to 3)	90	75.00
3	High (4 & above 4)	7	5.83

It was observed from table 1 that, majority of the dryland farmers were middle aged farmers (60.00%), educated up to higher secondary school level (35.83%), medium size of family (65.00%), having marginal land holdings (40.83%), with medium level of annual income (87.50%), medium extension participation (52.50%) and belonged to medium level of social participation (75.00%).

Table 2: Overall Knowledge of farmers about dryland technologies among farmers

Knowledge			
Sr. No	**Category**	**Frequency**	**Percentage**
1	Low (Up to 7)	32	26.67
2	Medium (8 to 14)	74	61.67
3	High (15 & Above)	14	11.67
Total		120	100.00

The table 2 showed that, majority of respondents, 61.67 percent had medium level of knowledge about dryland technologies, followed by low, 26.67 percent and high, 11.67 percent level of knowledge.

The majority of farmers knew only a little bit about dryland technologies. The most likely explanation is that the majority of them had medium levels of income, were educated up to the middle and high school levels, and participated in extension activities to a moderate degree. These findings were supported by Niranjan and Dipak (2020) [11] and Umar *et al.* (2023) [12].

Table 3: Knowledge of Farmers about specific dryland technologies developed from VNMKV, Parbhani.

Sr. No.	Selected dry land technologies	Frequency	Percentage (%)
1	Do you know any Dry land technology developed from VNMKV Parbhani (If yes specify from below technologies)	74	61.66
2	Standardization of farm pond technology for assured rainfall zone	72	60
3	Application of cetyl alcohol for the control of evaporation in Farm pond	10	8.33
4	Protective irrigation through farm ponds using sprinkler irrigation	75	62.50
5	Borewell recharge technology for groundwater enhancement	72	60
6	Opening of the furrow system or intercropping in soybean + pigeon pea (4:2) and Cotton + Soyabean (1:1)	99	82.50
7	Broad bed furrow technique for soybean	90	75
8	Soyabean + Pigeon pea Strip cropping under mechanization	15	12.50
9	Contingency crop planning? (It gives information about what crop and varities to be sown for early and delayed rain fall areas.)	25	20.83
10	Sub soiling for in-situ moisture conservation and enhancing soyabean yield under rainfed condition	15	12.50
11	Open well recharge technology to enhance ground water	41	34.16
12	Tied ridges for moisture conservation in Pigeon pea	58	48.33
13	Rainfed integrated farming system model for small and marginal farm holdings for Marathwada region (Model comprises cropping system, Fodder crops, Fruit crops, Goatery and Poultry)	16	13.33
14	Potassium nitrate (KNO_3) Foliar application in Soyabean for dry spell mitigation	10	8.33
15	Prominent cropping systems under various tillage practices in vertisols	8	6.66
16	Mechanization for enhancing productivity of soyabean-safflower sequence cropping	16	13.33
17	Cotton residue incorporation with tillage and integrated nutrient management in Bt cotton	11	9.16
18	Maize-based inter cropping systems (Maize + Soyabean) and (Maize + green gram)	17	14.16
19	Do you aware about any old dry land technologies (If yes specify in the below technologies)	89	74.16
20	Formation of contour bunds to control Runoff and soil loss	115	95.83
21	Formation of check dams to increase Ground water level	70	58.33
22	Deep ploughing in summer season to break hard pans in the field	78	65
23	Mulching to control the evaporation	26	21.66
24	Crop rotation	109	90.83
25	Retention of previous crop residue which act as barrier and slow down the velocity of runoff water and Increase the soil moisture	12	10
26	Rain water management	82	68.33

It was revealed from table 3 that, 61.66 percent of farmers knew about dry land technology developed from VNMKV Parbhani, 60 percent of farmers are aware of the standardization of farm pond technology for assured rainfall zone, 8.33 percent of farmers knew about application of cetyl alcohol for the control of evaporation in Farm pond, 62.50 percent of farmers are aware of protective irrigation through farm ponds using sprinkler irrigation, 60.00 percent of farmers are aware of Borewell recharge technology for groundwater enhancement, 82.50 percent of farmers are aware of the opening of the furrow system or intercropping in soybean + pigeon pea (4:2) and Cotton + Soyabean (1:1), 75.00 percent of farmers are aware of the broad bed furrow technique for soybean, 12.50 percent of farmers are aware about Soyabean + Pigeon pea Strip cropping under mechanization. 20.83 percent of farmers are aware about Contingency crop planning and 12.50 percent of farmers are aware about sub soiling for in-situ moisture conservation and enhancing soyabean yield under rainfed condition.

Further, table 3 revealed that, 34.16 percent of farmers are aware of Open well recharge technology to enhance ground water, 48.33 percent of farmers are aware of Tied ridges for moisture conservation in Pigeon pea, 13.33 percent of farmers are aware about rainfed integrated farming system model for small and marginal farm holdings for Marathwada region (Model comprises cropping system, Fodder crops, Fruit crops, Goatery and Poultry), 8.33 percent of farmers are aware of Potassium nitrate (KNO_3) Foliar application in Soyabean for dry spell mitigation, 6.66 percent of farmers are aware about prominent cropping systems under various tillage practices in vertisols, 13.33 percent of farmers are aware of mechanization for enhancing productivity of soyabean-safflower sequence cropping, 9.16 percent of farmers are aware of cotton residue incorporation with tillage and integrated nutrient management in Bt cotton, 14.16 percent of farmers are aware of the maize-based inter cropping systems (Maize + Soyabean) and (Maize + green gram).

It was revealed from table 3 that, some farmers are still aware about old dryland technologies like, 95.83 percent of farmers are aware of the formation of contour bunds to control runoff and soil loss, 58.33 percent of farmers are

aware of the formation of check dams to increase ground water level, 65.00 percent of farmers are aware about deep ploughing in summer season to break hard pans in the field, 21.66 percent of farmers are aware about mulching to control the evaporation, 90.83 percent of farmers are aware about crop rotation, 10.00 percent of farmers are aware of retention of previous crop residue which act as barrier and slow down the velocity of runoff water and increase the soil moisture, 68.33 percent of farmers are aware of rain water management.

The probable reasons for medium range of knowledge could be that they are less aware about newly developed dryland technologies in recent days and they have not got maximum information from VNMKV, Parbhani and KVK, Parbhani about the dry land technologies developed from VNMKV, parbhani which are recommended dry land areas along with the precautions that are supposed to be taken while practicing those technologies.

4. Conclusion

It was observed that majority of the dryland farmers were middle aged farmers (60%), educated up to higher secondary school level (35.83%), medium size of family (65%), having marginal land holdings (40.83%), with medium level of annual income (87.50%), medium extension participation (52.50%) and belonged to medium level of social participation.

It is concluded that majority of respondents, 61.67 percent had medium level of knowledge about dryland technologies, followed by low, 26.67 percent and high, 11.67 percent level of knowledge.

Overall, the study suggests that promoting the adoption of dryland technologies among dryland farmers requires a multi-faceted approach that addresses knowledge gaps, ensures availability and accessibility, and provides policy support. By addressing the knowledge gaps identified in this study, policymakers, extension agencies, and other stakeholders can develop effective strategies to promote the adoption of dryland technologies among dryland farmers. Ultimately, this can contribute to improved crop productivity, soil health, and environmental sustainability.

References

1. Prashanth P, Jaganmohan RM. Study on the profile of organic cotton farmers of Karimnagar district of Andhra Pradesh. International Journal of Farm Sciences. 2012;2(2):134-140.
2. Nigade DD. Impact of Kisan Credit Card scheme among the beneficiaries of Marathwada region [dissertation]. Parbhani (India): Vasantrao Naik Marathwada Krishi Vidyapeeth; 2022.
3. Kale ND. Impact of National Agricultural Innovation Project on its beneficiaries in Marathwada region [master's thesis]. Parbhani (India): Vasantrao Naik Marathwada Krishi Vidyapeeth; 2020.
4. Murmu RR, Bose DK, Jahanara. Knowledge of the beneficiaries and non-beneficiaries about Kisan Credit Card Scheme in Deoghar Block of Deoghar District, Jharkhand, India. International Journal of Current Microbiology and Applied Sciences. 2019;8(6):435-442.
5. Raghuwansi S. A study on adoption of improved production technology by the soybean growers in Hoshangabad of M.P. [master's thesis]. Jabalpur (India): Jawaharlal Nehru Krishi Vishwa Vidyalaya; 2010.
6. Yadav SK, Prajati RR, Prajapati MR, Patel VT. Training needs and relative suitability for training programmes of tomato growers in Jaipur district of Rajasthan state. International Journal of Agricultural Sciences. 2016;8(13):1206-1209.
7. Parmar L. An evaluation study of farmer field school on soybean management practices conducted by agriculture department of Tikamgarh district Madhya Pradesh [master's thesis]. Jabalpur (India): Jawaharlal Nehru Krishi Vishwa Vidyalaya; 2014.
8. Puneet. A study on adoption of dairy management practices by KVK trained farmers [master's thesis]. Shivamogga (India): University of Agricultural and Horticultural Sciences; 2016.
9. Mishra NM. Knowledge and attitude of farmers towards Soil Health Card Scheme in Tikamgarh district of Madhya Pradesh [master's thesis]. Jabalpur (India): Jawaharlal Nehru Krishi Vishwa Vidyalaya; 2020 [cited 2025 Aug 8]. Available from: https://krishikosh.egranth.ac.in/handle/1/581179528
10. Choudhary V. Study on impact of Watershed Development Programme on productivity of major crops grown by the beneficiaries of Katangi block of Balaghat District (M.P.) [master's thesis]. Jabalpur (India): Jawaharlal Nehru Krishi Vishwa Vidyalaya; 2010.
11. Niranjan AD, Bose DK. Dryland farmers on climate resilient practices-An adoption study at an industrialized taluk of Tamil Nadu. Asian Journal of Agricultural Extension, Economics & Sociology. 2020;38(12):169-177.
12. Umar A, Muazu M, Abdullahi U. Women farmers' knowledge and adoption of dryland farming techniques in north eastern Nigeria. Advance Journal of Science, Engineering and Technology. 2023;5(12):13-21.
13. Badgujjar MK. A study on knowledge and adoption of organic farming practices among the farmers in Sehore District (M.P.) [master's thesis]. Gwalior (India): Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya; 2012.