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### Enhancing knowledge and adoption of critical interventions among dryland farmers: Strategies for sustainability

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#### Abstract

This study aimed to identify the suggestions of dryland farmers in adopting critical interventions in major crops and develop strategies to enhance their knowledge and adoption. The results showed that farmers suggested training on *in-situ* moisture conservation, subsidies on micro irrigation systems, timely supply of quality seeds and inputs, financial assistance during drought, and completing irrigation projects. To address these suggestions, a comprehensive strategy was developed, comprising extension, research, and policy interventions. Extension interventions include creating awareness through traditional mass media and ICT, social participatory methods, adult education programs, and implementing the Institute Village Linkage Programme. Research interventions involve developing drought-tolerant varieties, low-cost micro irrigation technologies, and methods for *in-situ* moisture conservation and input minimization. Policy interventions include investing in intensive extension services, providing subsidies for high-cost interventions, de-risking dryland agriculture through weather-based crop insurance, encouraging rural youth into farming, and creating platforms for better access to credit facilities. These strategies can enhance dryland farmers' knowledge and adoption of critical interventions, ultimately improving productivity and sustainability. The study highlights the importance of a comprehensive approach to addressing the challenges faced by dryland farmers and promoting sustainable agriculture practices.

**Keywords:** Critical interventions, dryland farmers, knowledge and adoption

#### Introduction

FAO has defined drylands as those areas with a length of growing period (LGP) of 1-179 days (FAO, 2000) <sup>[4]</sup>; this includes regions classified climatically as arid, semi-arid and dry sub-humid. Based on the FAO Global Agro-Ecological Zones (GAEZ) modelling system (FAO, 2020) <sup>[5]</sup>, drylands represent 43.20% of total global area in 2020, and are predicted to be 44.20% in 2050. Rainfed agro-ecosystems occupy a considerable place in Indian agriculture, covering 80 M ha in arid, semi-arid and sub-humid climatic zones; constituting nearly 57% of the net cultivated area. Rainfed agriculture supports 40% of human population and 60% livestock population. About 70% of rural population lives in rainfed areas and their livelihoods depend on success or failure of the crops (Rao *et al.*, 2016) <sup>[9]</sup>. Climate change can act as a conflict threat multiplier, whereby already fragile ecosystems and local communities are pushed beyond coping capacity, resulting in increasing tensions related to natural resource access and use (IPCC, 2019) <sup>[6]</sup>. Productivity of rainfed agriculture continues to remain low due to multiple risks and constraints relating to

biophysical and socio-economic issues (Rao *et al.*, 2016) <sup>[9]</sup>. Advancement and adoption of moisture conservation technologies by the farmers may improve dryland crop productivity, farm income along with upliftment in their livelihood. Furthermore, harnessing every inch of rainfed lands by following highly efficient technologies is also need of the hour to feed the ever-increasing population (Kaur *et al.*, 2022) <sup>[7]</sup>.

According to the report by the Commission on Inclusive and Sustainable Agricultural Development of Andhra Pradesh (2016), out of the 645 non-urban mandals in the state, 129 have been identified as extremely resource-deprived. These mandals are predominantly located in Anantapuramu (51), Kurnool (30), Kadapa (24), and Prakasam (18). Notably, 64.30 percent of the 129 severely resource-deprived mandals are in the Rayalaseema and Prakasam districts. Prakasam has been considered highly vulnerable under Climate Change vulnerability on account of increased frequency of occurrence of drought /erratic monsoon. With over 60% area under rainfed farming, sustaining the livelihood is a key challenge in the district. (NABARD,

2021)<sup>[8]</sup>. Moreover, Prakasam district has the highest area under dryland among coastal districts of Andhra Pradesh. So, the prevailing situation necessitates to enhance the knowledge and adoption of critical interventions among dryland farmers.

### Methodology

This study employed a combination of qualitative and quantitative methods to gather data from dryland farmers in the Prakasam district of Andhra Pradesh. A sample of 120 dryland farmers was selected through a multi-stage random sampling technique. A structured questionnaire was administered to gather data on farmers' suggestions for adopting critical interventions in major crops. Focus group discussions were conducted to gather more in-depth information on farmers' perceptions and suggestions. Key informant interviews were conducted with extension agents, researchers, and policymakers to gather information on existing interventions and strategies. Frequency and percentage analysis was used to rank the suggestions given

by farmers. Content analysis was used to analyze the qualitative data from focus group discussions and key informant interviews. Based on the findings, a comprehensive strategy was developed comprising extension, research, and policy interventions. The strategy was developed in consultation with stakeholders, including farmers, extension agents, researchers, and policymakers. The methodology employed in this study allowed for a comprehensive understanding of the suggestions and perceptions of dryland farmers, and the development of a tailored strategy to enhance their knowledge and adoption of critical interventions.

### Results and Discussion

Suggestions given by the Dryland Farmers in the Adoption of Critical Interventions in Major Crops Suggestions as perceived by the dryland farmers in the adoption of critical interventions in major crops is presented in Table 1 and ranks were given based on the frequency and percentage.

**Table 1:** Suggestions given by the dryland farmers in the adoption of critical interventions in major crops (n = 120)

| S. No. | Suggestions*                                                                                                                   | Frequency | Percentage | Rank |
|--------|--------------------------------------------------------------------------------------------------------------------------------|-----------|------------|------|
| 1.     | Training on <i>in-situ</i> moisture conservation and drought mitigating technologies                                           | 109       | 90.83      | I    |
| 2.     | Subsidies on micro irrigation systems for field crops                                                                          | 106       | 88.33      | II   |
| 3.     | Timely supply of quality seeds and inputs through Rythu Bharosa Kendras (RBKs)                                                 | 96        | 80.00      | III  |
| 4.     | Financial assistance from the government at the time of drought                                                                | 91        | 75.83      | IV   |
| 5.     | Providing irrigation facilities by completing Veligonda irrigation project as early as possible                                | 82        | 68.33      | V    |
| 6.     | Developing suitable drought resistant varieties and encouraging multiplication of these varieties through seed village concept | 78        | 65.00      | VI   |
| 7.     | Assistance from financial institutes with low interest rates                                                                   | 73        | 60.83      | VII  |

The data indicated the suggestions given by the farmers. The major suggestions as perceived by the dryland farmers in rank order are conducting training programmes on *in-situ* moisture conservation and drought mitigating technologies (90.83%) which ranked first followed by subsidies on micro irrigation systems for field crops (88.33%) ranking second in rank order, timely supply of quality seeds and inputs through Raithu Bharosa Kendras (80.00%) which ranked third, assistance from the government at the time of drought (75.83%) ranked fourth and providing irrigation facilities by completing Veligonda irrigation project as early as possible (68.33%) ranked fifth. Other suggestions given by the farmers were developing suitable drought resistant varieties and encouraging multiplication of these varieties through seed village concept (65.00%), assistance from financial institutes with low interest rates (60.83%) with sixth and seventh ranks respectively.

The findings imply that the extension agencies have to take the responsibility of creating awareness and motivating the farmers on drought mitigation techniques. As most of the dryland farmers in the study area are illiterate, the extension personnel must consistently make use of traditional mass media like folkways, puppet shows *etc.* to create awareness and motivate them on critical interventions rather utilizing the routine methods. Another important suggestion given by the respondents was financial assistance from the government during drought. Most of the farmers from the study area are small and marginal farmers and the impact on these sectors is more observable than on large farmers due

to their financial conditions. Hence, the farmers felt that assistance from the government like subsidized supply of food grains, fodder for animals, waiving interest on loans to some extent help them to overcome the financial crisis. The farmers also felt that completion of the irrigation project in time and developing drought tolerant varieties would certainly help them to adopt the critical interventions to a large extent.

### Strategy to enhance level of knowledge and extent of adoption of critical interventions of major crops of the dryland farmers

#### Extension Interventions

Create awareness on critical interventions in dryland farming by combining traditional mass media and information and communication technologies to create awareness on critical interventions.

Encourage social participatory methods like farmer interest groups and other farmer organizations to increase farmer's exposure to the new interventions and also encourage them to try out new practices.

Conduct adult education programmes in the dryland areas to increase the functional literacy of the farmers.

Implementing the Institute Village Linkage Programme in a systematic manner by the KVKs and NGOs operating in the area for large scale adoption of critical interventions.

Adopting whole family approach for training farm families on diversified activities for income generation in dryland areas.

### Research Interventions

Developing suitable drought tolerant varieties and making them available to the farmers by large scale multiplication through seed village concept.

Developing low-cost micro irrigation technologies exclusively for Dryland farming.

Village adoption by research institutions like KVKs is a mechanism to transfer new dryland interventions from research institutions will provide much needed support to the farming community.

Developing methods and techniques for *in-situ* moisture conservation in cost effective way.

Developing methods and techniques for input minimization and output maximization in dryland areas.

### Policy Interventions

Government should invest in intensive extension services

and create mechanisms that enhance the farmer's level of knowledge through both formal and informal exchange of information.

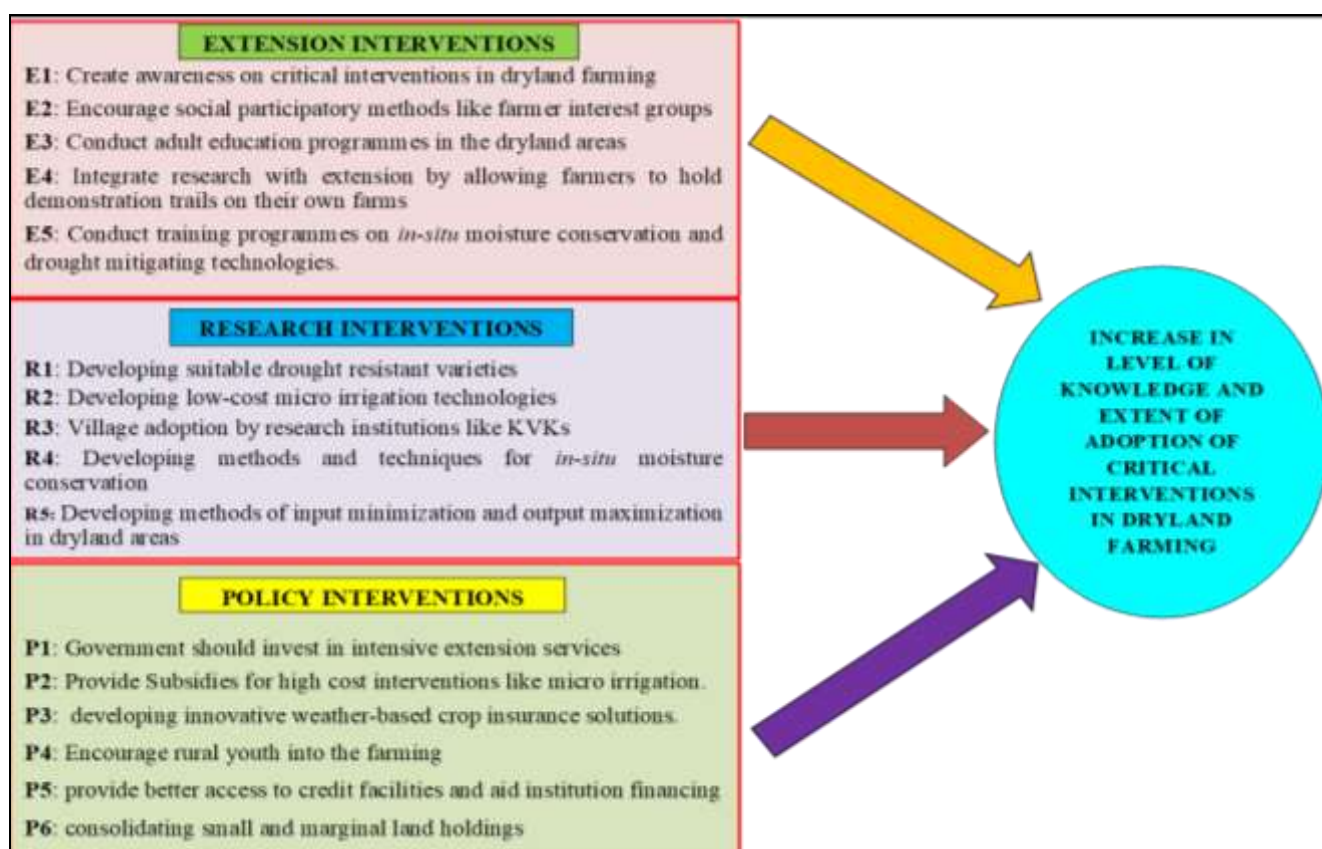
Provide subsidies for high-cost interventions like micro irrigation systems to make dryland farming reasonable to the majority of the small and marginal farmers.

De-risking dryland agriculture by developing innovative weather-based crop insurance solutions.

Encourage rural youth into the farming who were very enthusiastic in seeking information and trying new practices.

Create platforms to provide better access to credit facilities and aid institution financing to reduce the cost of borrowing for farmers.

Create risk free environment that allows the farmers to try new interventions by consolidating small and marginal land holdings.



**Fig 1:** Strategy to enhance level of knowledge and extent of adoption of critical interventions by dryland farmers

### Conclusion

This study aimed to identify the suggestions of dryland farmers in adopting critical interventions in major crops and develop strategies to enhance their knowledge and adoption. The results showed that farmers suggested training on *in-situ* moisture conservation, subsidies on micro irrigation systems, timely supply of quality seeds and inputs, financial assistance during drought, and completing irrigation projects. A comprehensive strategy was developed, comprising extension, research, and policy interventions. The study highlights the importance of a comprehensive approach to addressing the challenges faced by dryland farmers and promoting sustainable agriculture practices. The findings of this study have important implications for

policymakers, extension agents, researchers, and other stakeholders working to improve the livelihoods of dryland farmers. By addressing the suggestions and concerns of dryland farmers, we can enhance their knowledge and adoption of critical interventions, ultimately improving productivity and sustainability. The study recommends that extension agencies, research institutions, and policymakers work together to create awareness, provide training, and develop innovative solutions to support dryland farmers in adopting critical interventions. Overall, this study contributes to the existing body of knowledge on dryland agriculture by providing insights into the suggestions and perceptions of dryland farmers in adopting critical interventions. The comprehensive strategy developed in this

study can serve as a model for other regions and countries facing similar challenges in dryland agriculture.

## References

1. Commission on Inclusive and Sustainable Agricultural Development of Andhra Pradesh. Revitalizing rainfed agriculture of Andhra Pradesh. Andhra Pradesh; c2016.
2. Directorate of Economics and Statistics, Government of Andhra Pradesh. Agricultural statistics at a glance. Andhra Pradesh; c2020. p. 8-16.
3. District Planning Office, Prakasam. District hand book of statistics. Prakasam; c2018.
4. FAO. Agriculture: towards 2015/30. Technical Interim Report. Economic and Social Dept., FAO; Rome; c2000.
5. FAO. Towards a global programme on sustainable dryland agriculture. Food and Agriculture Organization of the United Nations; Rome; c2020.
6. IPCC. Climate change and land (special report). [Internet]; c2019. Available from: <https://www.ipcc.ch/srccl/>
7. Kaur R, Kumar S, Jaidka M. Increasing crop productivity in dryland/rainfed areas for achieving the sustainability goal of zero hunger. Indian Farming. 2022;72(07):07-10.
8. NABARD. Potential linked credit plan (Prakasam). National Bank for Agriculture and Rural Development, Andhra Pradesh Regional Office; c2021.
9. Rao Ch S, Gopinath KA, Prasad YG, Sikka AK, Singh R. Climate resilient rainfed agriculture status and strategies. Indian Farming. 2016;66(2):02-06.