

A Study on Technological Mitigation Strategies of Farmers to Overcome Drought Situations in Namakkal District

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Abstract: A drought is an extended period where water availability falls below the statistical requirements for a region. Monsoon failure is experienced in many parts of the country almost every year. The study was conducted in Namakkal district of Tamil Nadu state, with the objective to identify and document the technological mitigation strategies that are currently adopted by farmers in the study area to overcome the adverse effects of drought. Simple random sampling method was used in selection of 100 farmers each 50 belongs to annual and seasonal crops respectively. Considering various technological mitigation practices the awareness, acceptance and adoption level of farmers were collected and the data were analyzed using percentage analysis. The findings revealed that more than 75.00 per cent of the respondents were aware of most of the technological mitigation strategies. When it comes to the acceptance level of technological mitigation strategies, a gap between awareness and acceptance was found. Nearly 50.00-60.00 per cent respondents who were aware of the technologies like drip / sprinkler method of irrigation, mulching and selection of drought tolerant varieties and application of anti-transpirant chemicals sprays but not adopted them. The technological mitigation strategies promoted by the extension agents were adopted by half of the realized farmers. As most of them are beneficiaries of these programmes.

Keywords: Drought, Technological mitigation strategies, Awareness, Acceptance, Adoption

1. Introduction

India Meteorological Department (IMD) (2014) reported that approximately 16 per cent of India's geographic area, mostly arid, semi-arid and sub-humid is drought-prone. Due to high temporal and spatial variability in rainfall and wide variations in physiographic and climatic conditions in the country, droughts are experienced in varying intensities (moderate or severe) almost every year irrespective of a good monsoon.

Since 2001, the country has experienced Six major droughts, in the years of 2002, 2004, 2009, 2012, 2013 and 2016 severely affecting the various sectors and overall economic development of the country, the capacity to cope with the adverse impacts is steadily increasing due to improved technology, irrigation practices and partly due to diversification of rural economic activities away from pure farm activity. Tamil Nadu was witnessing severe drought leading to poor agricultural productivity, rural distress, acute shortage of drinking water and fodder in the last consecutive 5 years and the state government declared the state as drought hit in 2012-2013, 2016-17 (State Planning Commission report 2016). In Tamil Nadu, drought was viewed as a long- term development challenges and hence efforts were made to tackle the challenges through a multi-sectorial and multi-dimensional efforts to overcome. Such efforts are mainly concentrated on the aspects like access to risk-reducing and productivity-enhancing technologies, diversification of livelihoods, better access to crop insurance and improved infrastructure for reducing vulnerability of poor due to failure of monsoon. In order to assess the effect of those efforts the present study entitled as An Explorative

study of mitigation strategies followed by farmers to overcome drought situations in Namakkal district with one of the objective to identify and document the coping strategies followed by farmers to overcome the adverse effects of drought.

Recent researchers have aimed at documenting the different adaptation or coping strategies followed by farmers to overcome drought situations using some of the technological practices. Bradshaw *et al* (2004) reported that important adaptation options in the agricultural practices includes, crop diversification, mixed crop, livestock farming systems, using different crop varieties, changing planting and harvesting dates and mixing less productive, drought-resistant varieties and high-yield water sensitive crops. Saravanakumar *et.al* (2014) reported that the coping mechanisms followed by the farmers to minimize the impacts of poor monsoon, the results revealed that reducing cultivated area was the major coping mechanisms and it was followed by 76 per cent of farmers. Secondly, growing drought tolerant crops was practiced by 61 per cent of farmers followed by more use of water harvesting techniques (56%), crop diversification and mixed cropping (48%), early/late planting (46%), growing annual crops to perennial crops (45%), traditional knowledge to pest and disease control for crops (45%). Habtamu *et.al* (2018) indicated that the coping strategy followed by the majority of farmers to respond to drought is by storing crop harvest (71.25%), saving money (11.25%) and storing crop residues for livestock (7.5%).

2. Methodology

Namakkal District of Tamil Nadu was purposively selected for this study, as it received normal rainfall only 2 years out of the past five years (Rainfall data 2017, JDA office Namakkal). Since this study is focused on coping up strategies being adopted by the different farmers, the experts opined that this study should cover both the seasonal crops and annual crops cultivated in this district. Keeping these in mind, two blocks namely Kabilarmalai block and Vennandur block out of 15 blocks of Namakkal district was chosen for major area of annual crops (namely Sugarcane and Tapioca) and Seasonal crops (Maize and Groundnut) respectively. Villages were chosen based on major area under cultivation and the respondents were chosen randomly to constitute the sample size of 100 from five villages. Data was collected through semi-structured interview schedule during Feb- March 2018.

Drought mitigation strategies means that the different coping mechanism that was followed by farmers in order to reduce the effects of drought in farm level. Here in this study, among different mitigation strategies carried out by farmers the technological mitigation strategies was taken into consideration. The Coping mechanism followed by the farmers to mitigate the drought through some proven scientific technologies recommended by the Tamil Nadu Agricultural University and popularized by the State Department of Agriculture and Horticulture is termed as Technological Mitigation Strategies.

3. Results and Discussions

The Awareness, acceptance and adoption level of farmers regarding technological mitigation strategies was give table 1.

Table 1: Awareness, acceptance and adoption level of farmers regarding Technological Mitigation Strategies, (n=100)

S. No	Technological mitigation strategies followed	Awareness	No. of respondents Accepted	No. of respondents adopted	No. of respondents Aware but not adopted
1	Drip/Sprinkler method of irrigation	88 9 (100%)	54 (61.36%)	37 (42.05%)	51 (57.95%)
2	Mulching (Stubble, straw or Plastic mulching) to reduce moisture loss	75 (100%)	56 (74.67%)	31 (41.33%)	44 (58.67%)
3	Selection of Drought tolerant varieties	79 (100%)	66 (83.54%)	38 (48.10%)	41 (51.9%)
4	Moving to Less water consuming crops	86 (100%)	83 (96.51%)	72 (83.72%)	14 (16.28%)
5	Changing of Planting dates	85 (100%)	79 (92.94%)	58 (68.24%)	27 (31.76%)
6	Formation of Farm pond or other rain water harvesting structures for effective management of scarce water	57 (100%)	32 (56.14%)	5 (8.77%)	52 (91.23%)
7	Application of anti-transpirant chemicals, Foliar Spray of Pink Pigmented Facultative Metholotrophs, Spraying crop boosters etc.	47 (100%)	30 (63.83%)	21 (44.68%)	26 (55.32%)
8	Preserving dry fodder for livestock	100 (100%)	97 (97%)	81 (81%)	19 (19%)

From the above table, it is observed that more than 75.00 per cent of the respondents were aware of most of the technological mitigation strategies. Such as preserving dry fodder for livestock (100.00%), drip / sprinkler method of irrigation (88.00%), moving to less water consuming crops (86.00%), changing of planting dates (85.00%), selection of drought tolerant varieties (79.00%) and mulching to reduce moisture loss (75.00%). Nearly half of the respondents were aware of formation of farm pond or other rain water harvesting structures (57.00%), Application of anti-transpirant chemicals, Foliar Spray of Pink Pigmented Facultative Metholotrophs (PPFM), Spraying crop boosters (47.00%) as technological mitigation strategies to overcome drought. As preservation of dry fodder is a traditional mitigation strategy being followed generation after generation. So, the awareness level was found to be higher.

Metholotrophs (PPFM), spraying crop boosters is the technology promoted by KVK in limited scale through their On Farm Testing (OFT) less awareness is being observed.

When it comes to the acceptance of technological mitigation strategies, a gap between awareness and acceptance was found to be more in drip / sprinkler method of irrigation followed by formation of farm pond, use of mulching to reduce moisture loss, Application of anti-transpirant chemicals, PPFM, crop boosters. The gap was found to be very low related to the technologies like moving to less water consuming crops, preserving dry fodder for livestock and changing planting dates according to the availability of soil moisture.

Due to intensive extension strategies being promoted through various programmes like NATP (National Agricultural Technology Project), NHM (National Horticulture Mission), Precision farming etc. The awareness level on drip/sprinkler method of irrigation, selection of drought tolerant varieties and mulching to reduce moisture loss these technologies was found to be higher. Though formation of farm pond was promoted by the State Agricultural Department for the last one decade, such establishments were not well routed. As farmers was fear of losing their cropped area. Application of anti-transpirant chemicals, Foliar Spray of Pink Pigmented Facultative

The trend that has been expressed above indicates that respondents are not having full realization of water conservation and preservation methods that are being promoted through different extension programmes. The technologies such as moving to less water consuming crops, preserving dry fodder for livestock and changing of planting dates as these are traditionally being followed and being observed. Most of the respondents didn't have any difficulties in acceptance of these practices. In order to ascertain the percentage of respondents who have not adopted the technological mitigation strategies even though aware of them was worked out and presented in the above table1, it can be observed from that, the technological gap was found to be low only in moving to less water consuming

crops followed by preservation of dry fodder for livestock and changing the planting dates according to the availability of moisture. Nearly 50.00-60.00 per cent respondents who were aware of the technologies like drip / sprinkler method of irrigation, mulching and selection of drought tolerant varieties and application of anti-transpirant chemicals sprays but not adopted them.

structures among the already realized farmers. As the initial investment for establishment of rain water harvesting structures was found to be higher and fear of losing available cultivable area might be the reasons for the less adoption. The technological mitigation strategies promoted by the extension agents were adopted by half of the realized farmers. As most of them are beneficiaries of these programmes.

The higher level of technological adoption gap is observed in formation of farm pond or other rain water harvesting

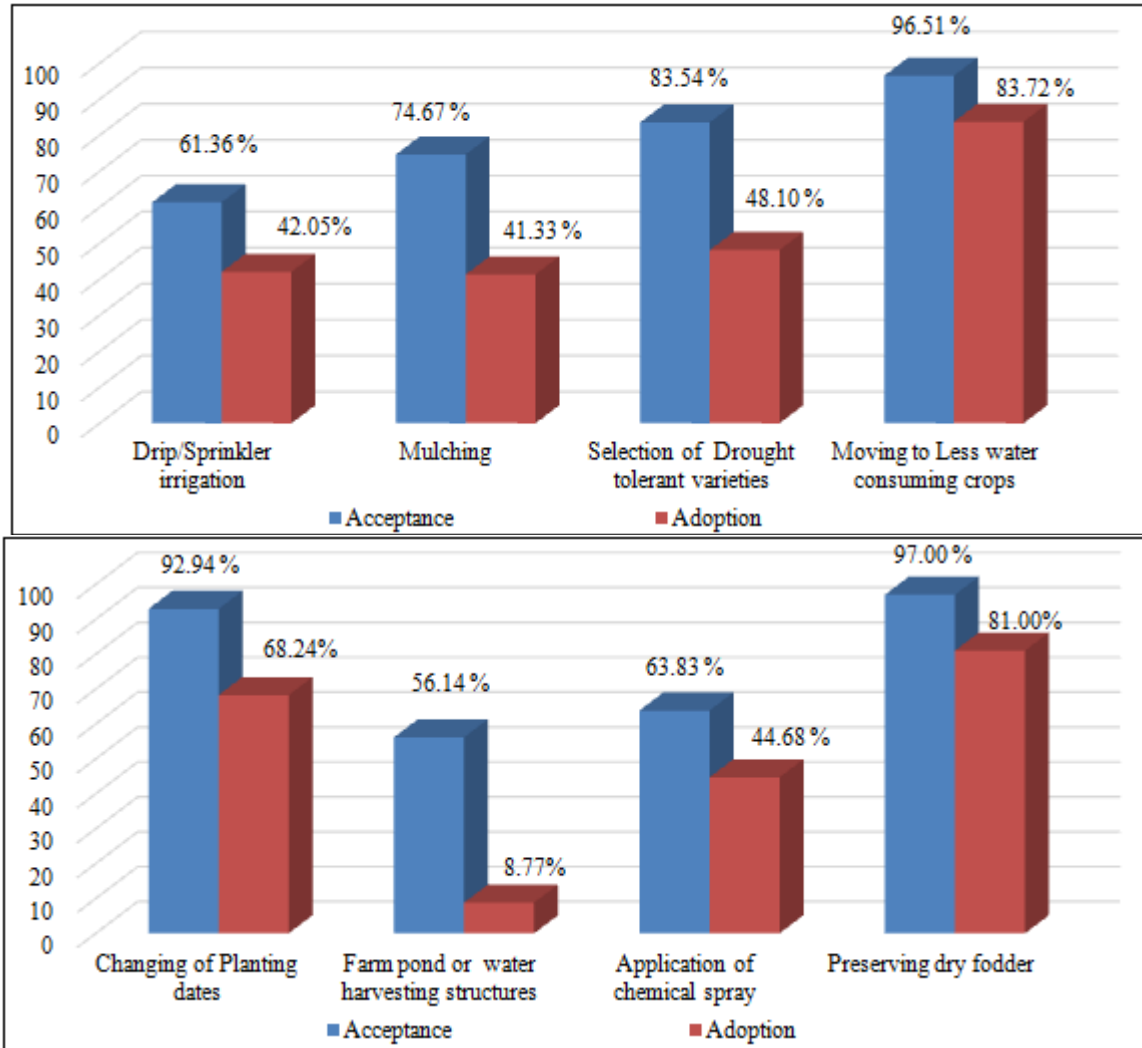


Figure 1: Extent of Acceptance and Adoption of Technological Mitigation Strategies





Plate 1: Data collection with annual crops and seasonal crops growers

4. Conclusion

Based on my research it can be concluded that, even though many technologies are promoted by State Department of Agriculture and Tamil Nadu Agricultural University for farmers to mitigating drought situation. The farmers are interested in adopting traditional mitigation practices that are being followed generation after generation. This may be due to reason that less knowledge regarding those scientific technological practices.

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