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Extent of adoption and Socio-economic impact of TNAU Millet varieties and technologies in Dharmapuri District

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Abstract
Dharmapuri district is one of the districts where tribal farmers produce millet on a larger scale, it was purposefully chosen for this study to examine the socio-economic impact of TNAU Millet varieties and technologies. For this study, the ex-post facto research design was used. For the purpose of this study, four villages from the Dharmapuri and Pappireddipatti blocks in the Dharmapuri district were chosen namely Kombur, Ajjampatty, Sitheri, and Vathalmalai. A simple random sampling technique was used to select 100 respondents from these villages for the sample size. To obtain comprehensive meaning of interpretations, a statistical test was run on the acquired data. More than half of the respondents to this study accepted the TNAU-released cultivars of *Sorghum* (K12), ragi (CO 15), and Samai (CO), Kudiraivali (CO2), Panivaragu (CO 5), and Varagu (CO3). The majority of responders (87.00%) increased change in bore or deepen existing wells, provided higher education to children, increased their interaction with extension agencies (54.00%), and expanded organizational participation (38.00%). The majority of respondents didn't use the recommended seed treatments, NPK fertilizers, or nutrient applications. In order to increase awareness and understanding, the state department of agriculture and KVK should implement the appropriate measures, such as conducting regular field visits, demonstrations, and trainings.

Keywords: Millets, socio-economic, impact, technologies and tribal farmers

Introduction
Millets, small-seeded resilient crops that may thrive in arid zones or rain-fed places under limiting conditions of soil quality and moisture, are among the oldest known foods. Millets are grown in mountainous, rain-fed, tribal, and low-fertile environments. Millets have a relatively short growing season, which allows for rapid development from seed to harvest-ready crop in only 65 days or so. This highly beneficial characteristic of the millets is of vital importance in thickly populated regions of the world. If stored properly, millets can keep well for two years or beyond.

Millets can last for at least two years when properly preserved. Due to their short growth season, millets may very well fit into numerous cropping systems under irrigation as well as dryland farming. They can also thrive in poor soil or climate conditions and supply nutritious grain as well as feed.

The National Year of Millets has been declared by the Indian government in order to increase the production of the nutrient-rich millets and the agro-industries that are involved in their production. The celebration of the millet year will aid in boosting millet consumption and production across the nation. Long-term mitigation of the consequences of climate change and the battle against hunger will be made possible by expanded millet production. The country will benefit from increased millet production and consumption as a result of the millet year celebration.

Millet is primarily grown in the rainfed conditions with minimal management in the Pennagaram, Palacode, Harur, Morappur, and Nallampalli blocks of the Dharmapuri district. Due to reduced yields and the use of traditional, low producing cultivars, the area under millet production is currently decreasing. Due to the lack of adoption of high yielding varieties and hybrids as well as improved cultivation techniques, Pennagaram block's productivity is extremely poor when compared to the state average and just 50 per cent of the state average is being realized there. Hence, it is necessary to study the extent of adoption and socioeconomic effects of TNAU Millet varieties and technologies in Dharmapuri District.

Research Methodology

Dharmapuri District was specifically chosen for this study since it is one of the districts where tribal farmers plant millet on a larger scale. Based on the greatest number of tribal farmers who cultivate millet, Dharmapuri and Pappireddipatti blocks of Dharmapuri were chosen out of a total of ten blocks. 100 respondents from the chosen villages were included in the sample size using a random sampling technique. The respondents were personally questioned using a carefully planned and practiced interview schedule. To obtain comprehensive meaning interpretations, a statistical test was run on the acquired data. In-depth research and discussion were conducted on the socio-economic impact of TNAU millet varieties and technologies in Dharmapuri district.

Findings and Discussion

1. Extent of adoption of TNAU millet varieties and technologies by farmers

The tribal population in the selected villages predominantly engaged in the cultivation of *Sorghum*, Ragi, Samai, Varagu, Panivaragu and Kudiraivali. Extent of adoption of recommended varieties and cultivation technologies among the respondents. The overall and technology wise adoption were studied and presented in this section

Table 1: Distribution of respondents based on Overall adoption level

S. No.	Category	Number	Percentage
1.	Low	18	18.00
2.	Medium	46	46.00
3.	High	36	36.00
	Total	100	100.00

It could be inferred from Table 1, that most of the respondents (46.00%) had medium level of adoption of TNAU varieties followed by high (36.00%) and low (18.00%) respectively**.**

Technology wise adoption

To study the adoption level of the respondents towards the recommended TNAU varieties and technologies were considered and the findings on adoption level of the respondents on the selected practices are presented in table.2.

Table 2: Distribution of respondents according to their adoption of TNAU Varieties and technologies

S. No.	Varieties and technologies	Number	Percentage
1.	**TNAU Varieties**		
	Sorghum		
	Co32	36	36.00
	K 12	52	52.00
2.	**Ragi**		
	Co (Ra) 15	51	51.00
	ATL 1	35	35.00
3.	**Samai**		
	Co 4	62	62.00
	ATL 1	32	32.00
	Others (Local variety - Naaty)	12	12.00
4.	**Varagu**		
	Co3	68	68.00
	Local variety	42	42.00
5.	**Panivaragu**		
	Co (PV) 5	58	58.00
	Local variety	42	42.00
6.	**Kudiraivali**		
	Co2	62	62.00
7.	Season	79	79.00
9.	Seed rate (Recommended)	41	41.00
10.	Line Sowing	75	75.00
11.	Seed treatment	33	33.00
12.	Spacing	38	38.00
13.	Nutrient Management	25	25.00
14.	Weeding	47	47.00
15.	Thinning	35	35.00
15.	Fertilizer application	13	13.00
16.	Irrigation management	0	0.00
17.	Harvesting	86	86.00

Multiple responses

From the Table 2 & Fig.1, it could be inferred that more than half of the respondents adopted TNAU released varieties *viz*., *Sorghum* (K12), Ragi (CO15), Samai (CO4), Varagu (CO3), Panivaragu (CO5), and Kudiraivali (CO2). This might be due to continuous trainings and awareness programmes given to the tribal farmers by KVK scientist for the past several years. Most of the respondents (79.00%) had followed the recommended season for cultivating millet varieties and method of line sowing (75%) due to rain fed condition in their locality and regular exposure from KVK scientists throughout the cultivation period.

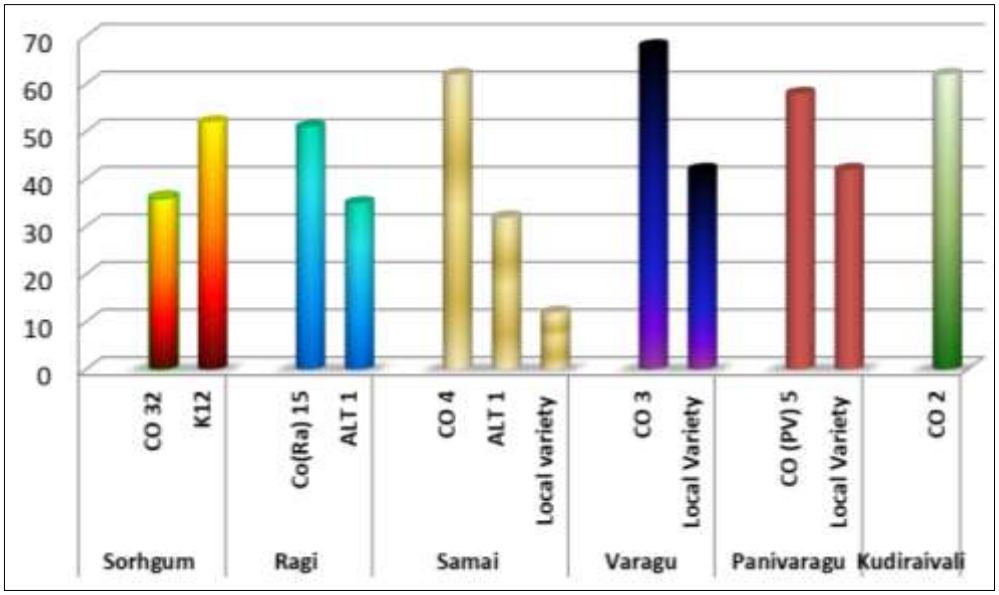

Fig 1: Extent of adoption of TNAU Released Varieties among farmers

More than three fourth of the respondents (86.00%) adopted correct harvesting practices at recommend time period. Less than half of the respondents adopted seed treatment (35.00%), spacing (38. 00%) and thinning (35.00%) practices. This might be due to lack of awareness and knowledge on the above said practices.

Little percentage of the respondents adopted nutrient management (25.00%) and recommended fertilizer (13.00%). Lack of awareness on role played by nutrients in plant growth and high cost of fertilizers might be the reason for the low adoption.

2. Socio economic impact perceived by the respondents as a result of millet cultivation

Table 3: Distribution of respondents according to their socio economic impact of millet cultivation (n=100)

S. No	Particulars	Change indicators					
		Increased		No change		Decreased	
	A. Farm changes	No	%	No	%	No	%
a.	Purchased new lands	22	22.00	78	78.00	-	-
b.	Improved the existing land	54	54.00	46	46.00	-	-
c.	Leased in lands for cultivation	26	26.00	74	74.00	-	-
d.	Leased out lands for cultivation	12	12.00	88	88.00	-	-
e.	Deepened the existing well / bore wells	87	87.00	13	13.00	-	-
f.	Dug new well / bore well	12	12.00	88	88.00		
g.	Purchased new implement	15	15.00	85	85.00		
h.	Purchased new tools / equipment	18	18.00	82	82.00		
i.	Purchased additional livestock	46	46.00	54	54.00		
	B. Material changes						
a.	Purchased new utensils	25	25.00	75	75.00		
b.	Purchased household appliances	20	20.00	80	80.00		
c.	Purchased new jewels	-	-	-	-		
d.	Purchased new vehicle	-	-	-	-		
e.	Purchased TV, Radio, Phone, Tape, etc	16	16.00	84	84.00		
	C. Descendents changes						
a.	Provided higher education to children	87	87.00	13	13.00	-	-
b.	Had better health care	14	14.00	86	86.00	-	-
c.	Had better nutritious food	42	42.00	58	58.00	-	-
d.	Spent more for religious and other activities	26	26.00	74	74.00	-	-
e.	Spent more for food and clothing's	35	35.00	54	54.00	11	11.00
	D. Economic changes						
a.	Repayment of loans	15	15.00	85	85.00	-	-
b.	Increased savings and deposits	-	-	-	-	-	-
	E. Social changes						
a.	Extension contact	54	54.00	46	46.00	-	-
b.	Organization participation	38	38.00	62	62.00	-	-
	Opinion leader	15	15.00	85	85.00	-	-
d.	Emerged as a leader	-	-	-	-	-	-
e.	Increased outside contact	-	-	-	-		

Multiple responses obtained

Farm changes

Majority of the respondents (87.00%) increased change was noticed in deepened the existing wells or bore wells, followed by improving the existing land (54.00%) and purchasing extra animals (46.00%).

Indicators like new land purchases, lands rented for cultivation, new tools and equipment purchases, wells dug or bore wells, new implement purchases, and lands leased for cultivation show that more than 70% of respondents felt no change as a result of millet cultivation technologies.

Material Changes

Two third of the respondents felt no change in indications like buying new kitchenware, home appliances, TVs, radios, phones, tapes, etc. when the data on material change was analyzed. A pitiful percentage of respondents claimed to have bought new kitchenware, home appliances, a TV, a radio, a phone, and tapes, among other items.

Changes in descendants

The majority of respondents (87.00%) said they spend more on children's education, followed by better nutrition (42.00%), more money on clothing and food (35.00%), and more money on religious and other activities (26.0%).

Economic changes

Only fifteen percent of the respondents had paid back their loans, and eighty-five percent reported no change. No one who responded had raised their savings or deposits. This may be because the tribes only receive a minimal profit, which could be used to buy live animals and pay for the children's higher education.

Social changes

Following organizational participation (38.00%), more than half of the respondents (54.00%) have increased their engagement with extension agencies. The above-mentioned findings could have been caused by frequent exposure to the trainings, demonstrations, and awareness campaigns held in their community by the KVK, Dharmapuri.

Conclusions

From the results it could be concluded that half of the respondents accepted the TNAU-released varieties of

Sorghum (K12), Ragi (CO 15), Samai (CO 4), Varagu (CO 3), Panivaragu (CO 5), and Kudiraivali (CO2). This may be the result of ongoing education and training programs that KVK scientists have been providing to tribal farmers for a number of years. The majority of responders didn't use the advised seed treatments, NPK fertilizers, or nutrient applications. Therefore, the state department of agriculture and KVK should take the necessary actions to increase awareness and knowledge through trainings, demonstrations, regular field visits and exposure visits.

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