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## Socio economic impact of rice variety CO 51 on farmers in Kancheepuram and Tiruvarur districts of Tamil Nadu

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**ABSTRACT:** Tamil Nadu Agricultural University has released a short duration high yielding rice variety CO 51 during 2013 to increase rice production in *Kuruvai* / *Sornavari* seasons for the benefit of Tamil Nadu state. A study was conducted during 2019 to assess the direct and indirect impact (economic, social and personal) of adopting CO 51, in Kancheepuram and Tiruvarur districts. In both the districts, 150 farmers cultivating CO 51 were purposively selected and interviewed by a well-structured interview schedule. The study on direct impact revealed that all the farmers at Kancheepuram district and 97 per cent at Tiruvarur district claimed the variety to be high yielding. Under indirect impact, the study on economic impact in both the districts revealed more emphasis on savings (99.00 per cent). The social impact indicated increased contact with people and organizations (above 90.00 per cent in both the districts). Majority of the farmers (99.00 per cent) preferred the recognition of being consulted on farming and other matters by peer farmers as the best personal impact. Thus, it was concluded that there was significant direct and indirect impact on adoption of rice variety CO 51 by farmers.

**Key words:** Kancheepuram, rice variety CO 51, socio economic impact, Tiruvarur districts, Tamil Nadu

Rice is one of the major crops in Tamil Nadu where farmers largely depend upon for their livelihood. The Kharif also called as *Kuruvai* / *Sornavari* / *Navarai* season in Tamil Nadu, is mainly dependent on early duration varieties wherein high grain yield is needed when comparing to existing varieties. As the old crop varieties become susceptible to pests and diseases besides seed deterioration, newer varieties are always wanted. The rice variety CO 51 was developed with such an objective. The variety is known for its features like short duration, high yielding, and wide adaptability and also has field resistance to BPH and Blast. The variety has been adopted on a large scale in Tamil Nadu besides being notified in 13 states across India. Introduced in 2013, the variety has become a game changer due to significant increase in yield as well savings in input cost due to minimal requirement of water and nutrients, besides tolerance to major pest and diseases. Keeping this in view, this study has been attempted to assess the socio economic impact on the rice growers of Tamil Nadu due to adoption of the rice variety CO 51. The study has been made broadly under two heads – Direct and Indirect Impacts. Under direct impact, the study was made under six categories. In case of indirect impact, the study was made under three sub heads – Economic impact, Social impact and personal impact.

### MATERIALS AND METHODS

The study was conducted in Kancheepuram and Tiruvarur districts due to the higher adoption of this variety. Three

blocks from each district were selected purposively and three villages per block were selected from each block. Fifty farmers were selected per block for study through random sampling. Thus, 300 farmers who cultivated CO 51 variety were purposely selected *i.e.*, 150 farmers from each district. Primary data from the farmers was collected with the help of a pre-tested interview schedule through personal interviews. Appropriate statistical analysis was done to get meaningful interpretation of the results.

### RESULTS AND DISCUSSION

#### Direct impact

The direct consequence that resulted due to adoption of rice variety CO 51 has been studied. The impact, assessed under six categories is presented in Table 1.

The study findings revealed that all the farmers in Kancheepuram district claimed that CO 51 resulted in higher yields whereas 97 per cent farmers accepted for higher yield in Tiruvarur district. This is in line with the finding by Theodore *et al.* (2017) who revealed that the increase in yield due to adoption of machine planting, which was the important component on the special package in rice, was nearly 40.00 per cent. Similar observation was made by Devi and Ponnarasi (2019) who reported that higher grain and straw yield ranked first among the reasons for adoption of SRI technology in rice. Accordingly, increase in income was also realized due to this variety in both the districts (99 per cent in Kancheepuram district and 94 per cent in Tiruvarur

district). Robin *et al.* (2019) reported that CO 51 has a yield advantage of 10.72 per cent against ADT 43, the existing short duration variety. On an average, the CO 51 has the capability of yielding 6623 Kg per hectare against 5982 Kg of ADT43. There is a significant yield advantage of 543 Kg /ha.

Decrease in yield was not observed in both the districts whereas only 2 per cent reported to have same yield. Decrease in income was reported by 1.00 per cent farmers in Kancheepuram district and 3.00 per cent in Tiruvarur district. No farmer reported to have a same income by cultivating CO 51 in Kancheepuram district whereas 5 per cent farmers in Tiruvarur district reported to have a same income as that of the old variety. The overall results showed that farmers were benefitted by the direct impact of having an increase in both, yield and income, by cultivating CO 51.

### Indirect impact

The change in the status of a farmer across key benchmarks or living standards as a consequence of adopting rice variety CO 51 is measured under indirect impact. These indirect impacts can also be termed as secondary impacts created by the direct impact due to adoption of CO 51. The details of the study with respect to farmers on various parameters considered for each category of indirect impact were:

### Economic impact

Economic impact will be the first indicator / resultant of

the direct impact in the chain or sequence of the series of impacts. The benefits reaped out of adoption of CO 51 –i.e. yield and income–will be reflected in the financial investments made by the farmers. The investing pattern of the cultivators of rice variety CO 51 was studied under commonly known investment options; and the responses were collected, analyzed and presented in Table 2

The cultivators of rice variety CO 51 in both the districts have followed a similar pattern regarding the priority of investment. To invest the increased income or surplus money accrued by CO 51 cultivation in Kancheepuram district, the top most priority was given to savings for their children (99.00 per cent) followed by maintaining a better bank balance (95.00 per cent), buying livestock (85.00 per cent), purchase of new house (61.00 per cent), enhancing irrigation capabilities (59.00 per cent). Further, the lesser priority was given to other options like investment on fencing, new farm equipment and buying lands. In Tiruvarur district too, the order of priority was found to be similar with the top five priorities observed in Kancheepuram district. Slight variations in the order of priority were noticed in remaining options.

The above findings reveal that the preference or priority of farmers to invest additional income looks natural against the back drop of the culture in an Indian / South Indian / Tamil society. KolawoleOgundari (2018) reported that adoption of agricultural innovations has a positive and significant effect on indicators of farm production and household welfare measures.

**Table 1: Distribution of respondents according to the direct impact (n=300)**

Categories		Kancheepuram District (n= 150)		Tiruvarur District (n=150)	
		No of farmers agreed	Per cent (%)	No of farmers agreed	Per cent (%)
A	Increase in yield	150	100.00	145	97.00
B	Decrease in yield	0	0.00	1	1.00
C	Same yield	3	2.00	3	2.00
D	Increase in income	148	99.00	141	94.00
E	Decrease in income	2	1.00	5	3.00
F	Same income	0	0.00	7	5.00

**Table 2: Distribution of respondents according to the Economic impact (n=300)**

Categories		Kancheepuram district			Tiruvarur district		
		No of farmers agreed	Per cent (%)	RANK	No of farmers agreed	Per cent (%)	RANK
A	Economic impact						
I	Bought additional lands	28	19.00	VII	43	29.00	VII
II	Bought new farm equipment	53	35.00	VI	4	3.00	IX
III	Bought new pump set for irrigation	89	59.00	V	109	73.00	V
IV	Bought livestock	127	85.00	III	126	84.00	III
V	Took up fencing for my farm	13	9.00	VIII	46	31.00	VI
V1	Constructed / bought new house	92	61.00	IV	112	75.00	IV
V11	Better bank balance	143	95.00	II	130	87.00	II
VIII	Savings for children	148	99.00	I	134	89.00	I
IX	Others	0	0.00	IX	18	12.00	VIII

**Table 3: Distribution of respondents according to the Social impact (N=300)**

Categories	Kancheepuram district		Tiruvarur district	
	No of farmers agreed	Per cent (%)	No of farmers agreed	Per cent (%)
B Social Impact				
I Increased outside contact with people and organizations	139	93.00	135	90.00
II Became an important contact farmer for TNAU / Department	75	50.00	88	59.00
III Became member of village / block / district committee	82	55.00	80	53.00
IV Able to get loans at ease with better terms	119	79.00	135	90.00
V Able to change credit source from informal to formal institutions	113	75.00	128	85.00
VI Able to source farm inputs in time	139	93.00	144	96.00

**Table 4: Distribution of respondents according to the personal impact(n=300)**

Categories	Kancheepuram district			Tiruvarur district		
	No of farmers agreed	Per cent (%)	Rank	No of farmers agreed	Per cent (%)	Rank
C. Personal Impact						
a. Consulted by other farmers on farming and other matters	148	99.00	I	148	99.00	I
b. Recognition in society due to high yield and income	135	90.00	II	138	92.00	II
c. Improved decision making capability	118	79.00	III	96	64.00	III
d. Attracted the attention of media and been in the limelight	86	57.00	IV	91	61.00	IV
f. Got more leisure time to attend other works	69	46.00	V	92	61.00	IV

This is followed by having a healthy bank balance which is more of having a financial comfort and safety to protect themselves against future setbacks like uncertainty of rain or drought. The order of priority given to options like buying livestock, new house and irrigation equipment indicated the graded investment based on the returns gained. But, the data clearly indicated that there was direct impact on the farmer's income due to adoption of rice variety CO 51 which also resulted in the indirect impact on the economic status of the farmers.

### ***Social impact***

Social impact is the consequence of economic impact in the impact chain. The economic development of a farmer will have its impact on the social status of the farmer as wealth visible opens the doors of recognition in the society. Study also attempted to assess the social impact on the farmers who adopted rice variety CO 51 under six parameters. The data collected were analyzed and are presented in Table 3.

The social impact due to adoption of rice variety CO 51 clearly indicated that there is a significant impact on the social status of the farmers. The impact, especially seems to have a cascading effect on the future farm activities too with most of the farmers responding that they got increased contact with people and organizations (above 90.00 per cent in both the districts) which could be seen in the response for other parameters like, they were able to get farm inputs on time (above 90.00 per cent in both the

districts), shift availing credit from informal to formal sources (75.00 per cent in Kancheepuram district and 85.00 per cent in Tiruvarur district) and get loans at better terms (79.00 per cent in Kancheepuram district and 90.00 per cent in Tiruvarur district). This results in succeeding effects as, availing loans from formal institutions ultimately result in savings on interest which again adds up to economic prosperity. The response to impact on becoming contact farmer of TNAU or member of Panchayat Unions at around 50.00 per cent can be attributed to the individual's willingness to be part of such social life. Hence, the findings can be construed as majority of the farmers had social impact due to adoption of rice variety CO 51.

### ***Personal impact***

The impact of adoption of rice variety CO 51 on the personal side of the rice growers in terms of psychological and physical aspects was studied under personal impact. While the economic and social impact are external which is a result of the visibility and perception created on others and its consequences, personal impact is the change that is realized by the individual for self. The data collected on the personal impact under five parameters are presented in Table 4.

The personal impact as perceived by the farmers due to adoption of rice variety CO 51 was ideal for farmers in Kancheepuram and Tiruvarur district. Majority of the farmers (99.00 per cent) preferred the recognition of being consulted on farming and other matters by peer farmers as

the best impact. This can be construed as their preference to be opinion leaders in their society which is a trait of innovators. This was followed by the recognition in the society due to high yield and income as the second best impact. Balasubramaniam (2005) also reported that 29.33 per cent of respondents considered recognition due to high income and high yield as the most influencing personal impact. Farmers also realized improvement in their own skill set as they could feel improvement in their decision making capability. A sizeable number of farmers (57.00 per cent in Kancheepuram and 61.00 per cent in Tiruvarur) enjoyed the attention they got and being in the limelight. This finding is in line with the results under social impact where the number of farmers preferring to become members of social institutions was similar in Kancheepuram district (55 per cent) and Tiruvarur district (53 per cent). Thus, it can be concluded that the personal impact on rice growers existed due to adoption of rice variety CO 51.

### CONCLUSION

Rice is the staple food of Tamil Nadu and lifeline of majority of farmers in the state. Hence, it is essential to keep developing new varieties that are superior to their predecessors. The success of any new variety is based on the impact it creates on the socio-economic status of the farmers on adoption. From this study, it can be concluded that the adoption of rice variety CO 51 had significant direct impact on higher yield and income among rice growers of Kancheepuram and Tiruvarur districts of Tamil Nadu. Similarly, the study revealed that rice growers preferred savings for their children, from the surplus income generated through adoption of CO 51 under economic impact, increased contact with people and organization under social impact and recognition of being considered as consultant by peer farmers under

personal impact as most significant in the indirect impact.

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