# Role of Castor (*Ricinus communis* L.) in the livelihood sustenance of Tribal farmers through Tribal Sub Plan Frontline Demonstration in Salem district of Tamil Nadu

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**ABSTRACT**

**In India, Gujarat, Rajasthan and Andhra Pradesh are the major castor producing states which contribute 84 percent of castor production. In Tamil Nadu, the districts namely Salem, Namakkal, Dharmapuri, Permbalur are important in their contribution to the increase in area and production of castor Nadu and its mainly grown castor as border crop and an intercrop under rainfed condition. An Identification of high yielding castor hybrids, development of production technology and dissemination of improved technology through FLDs resulted in increase of castor area, production and productivity of castor in Tamil Nadu. Cultivation of castor with improved technologies gave higher net returns ranged from Rs.50425 to 63290/ha, and a mean value of Rs.55998.33/ha as compared to local check with recorded Rs.18700 to 20185/ha and mean value of Rs.19173.33/ha. The improved production technology registered an additional net returns ranging from Rs.31725 to 43105/ha with a mean of Rs.36825/ha over local check. The average benefit cost ratio of the demonstration plot was 3.84, varying from 3.65 to 4.16 and that of local check was 2.24, varying from 2.20 to 2.30. It can be concluded that the front line demonstration through Tribal Sub Plan scheme with an integrated crop management techniques proved more productive and remunerative than that grown under local practices.**

**Key words:** Caster, climate, tribal farmers, frontline demonstration.

Castor (*Ricinus communis* L.) is an industrially important non-edible oilseed crop belongs to the family *Euphorbiaceae*. Castor grows as an indeterminate annual or perennial crop depending on climate and soil types in tropical, sub-tropical and warm temperate regions in throughout the globe. Castor crop is particularly suitable for small-scale, resource poor farmers located in marginal areas due to its ability to thrive under low rainfall and marginal fertility conditions (Damodaram and Hegde, 2010). Castor seed is the source of castor oil which containing 40-45 percent oil that is rich in triglycerides. Castor oil and its derivatives have applications in the manufacturing of soaps, lubricants, hydraulic and brake fluids, paints, dyes, coatings, inks, cold resistant plastics, waxes, polishes, nylon, pharmaceuticals and perfumes. Castor oil is commonly used in medicines as a laxative and to treat skin disorders. At present, castor crop is cultivated in 30 different countries throughout the globe, of which India, China, Brazil, Mozambique, Ethiopia and Thailand are the major castor producing countries accounting for 90 percent of the worlds' production. In India, world castor area and production accounts for nearly 66.5 and 82.9 percent, respectively (Ramanjaneyulu *et al.*, 2017). In India, castor is mostly limited to Gujarat, Rajasthan and Andhra Pradesh are the major producing states which contribute 84 per cent of castor production. It is also grown in the states of Tamil Nadu, Orissa, Uttar Pradesh, Maharashtra, Karnataka, Madhya Pradesh, and Bihar. In Tamil Nadu mainly castor is grown under rainfed condition as border crop and intercrop. The districts namely Salem, Namakkal, Dharmapuri, Perambalur are important in their contribution to increase in area and production of castor. In Tamil Nadu the castor crop needs to be developed high yielding castor hybrids, production technology and dissemination of improved agronomic practices

through Frontline demonstrations (FLDs) resulted in increased area, production and productivity of castor in Tamil Nadu (Anonymous, 2012). Frontline demonstrations under real farm conditions are one of the effective means of technology transfer with the primary objective of demonstrating the productivity potential and profitability of the latest improved cultivars and production technologies vis-a-vis prevailing farmers practices on farmers fields (Annual report, IIOR, 2011-12). In present study evaluated one hundred and ninety front line demonstrations were conducted in Salem District of Tamil Nadu from 2012- 13 to 2014 - 15 to demonstrate the improved castor production technologies that are suitable for the particular eco-system under AICRP Castor Tribal Sub Plan scheme sponsored by Indian Institute of Oilseeds Research, Hyderabad. An attempt was made to analyze the impact of the demonstrations in sociological, technological and economical changes in the tribal farmers and the resultant improvement in yield and income of the castor growers. With the following objectives (a) to assess the knowledge and adoption level of castor growers in Salem district of Tamil Nadu as an impact of TSP FLDs; (c) to assess the impact of TSP FLDs on yield and income obtained by the tribal farmers; (d) to suggest strategies to improve the castor cultivation scenario in Tamil Nadu.

## MATERIALS AND METHODS

The locale of the study was conducted in Salem District of Tamil Nadu by the Tamil Nadu Agricultural University, Tapioca and Castor Research Station (TCRS), Yethapur in the selected area under the TSP FLDs on castor. Geographically, Salem is situated in between latitude and longitude in the West. Average annual rainfall ranges of 750 mm in the North East monsoon. Maximum temperature in the month of June remains around $35^{O}C$ and minimum temperature in the month of January is around $20^{O}C$. In general soil types are mountain soil with acidic in nature. The availability fertility status of the soil is poor in nitrogen, medium in phosphorous and high in potash.

### Selection of villages for implementing TSP

The TSP programme has been implemented in the following blocks are having more than 40 percent tribal population depending on agriculture for their sustenance of Salem district such as Panamarathupatti, Valapady, Ganagvalli and Pachamalai. The tribal villages have been selected after having thorough discussion with Assistant Director of Agriculture and other block level agency of the concerned block about the geographical distribution, topography of the landmass, socio-economic status, knowledge level and cropping pattern of the village and anthropology of the tribal community. Based on the statistics obtained, the backward of the scheme implementation site is assessed. The location selected for implementation of the project is well suited for growing castor, because the people in that area are practicing rainfed agriculture.

### Basis of selection

The block selected for scheme implementation is comprises of more than 40 percenttribal population and villages has been selected with 100 percent tribal community. The tribal villages in these blocks were suffering from number of socio-economic constraints which affects productivity of crops. Depletion of natural resources coupled with degradation of land and water resources, lack of scientific approach to farming, growing low value high volume crops, post-harvest losses and resource poor farmers are posing serious threats to food, socio-economic livelihood and sustenance of the tribal farmers. The tribal farmers of the above mentioned blocks are growing wide variety of food crops among them minor millets occupy the major item, but the poor market prices coupled with low productivity incurs low income generation. Under these circumstances, doubling income generation through scientific cultivation of castor through adoption of Tribal Sub Plan will help the tribal farmers to fetch more income and it will enhance the socio-economic status in the years to come.

**Sample Design**: The study villages were namely, Maniyarkundam, Edapatti pudur, Periyakuttaimaduvu, Periyapakkalam, Nallamathi, Valasakalpatti where TSP FLDs were conducted during 2012 - 13 to 2014 - 15 and the corresponding non-FLD castor growers were selected through proportionate random sampling procedure. The final sample of the study included 25 each FLD and non-FLD castor growers (Table 1).

**Table 1. Details of front line demonstrations through Tribal sub-plan scheme on selected villages from Pethanaickenpalayam and Vazhapadi blocks in Salem district of Tamil Nadu**

| S.No | Number of Farmers | Year of implement | Name of the tribal block | Name of the tribal villages |
|---|---|---|---|---|
| 1 | 43 | 2012-13 | Pethanaickanpalayam | Edapatti pudur, Pattikara Sellankurichi, Kundiyapayyu, Palaiyavalavu Sellankurichi, Malakkaranvalavu, Pudur, Dekkampatti, Puthuvalavu Sellankurichi, Maniyarkundam, Navampattu and Karumanthurai. |
| 2 | 61 | 2013-14 | Valapadi Panamarathupatty Gangavalli | Periyakuttaimaduvu, Cinnakuttaimaduvu, Kallikadu, Keerapatti, Samakuttapatti, Adimalaipatti, Nulathukombai, Vedapatti, Periyapakkalam, Mayampadi, Vengamudi and Pazhaiyur. |
| 3 | 86 | 2014-15 | Valapadi Panamarathupatty Gangavalli | Samakuttapatti, Nallamathi, Valasakalpatti, Edappadi and Puzhuthikuttai. |

## RESULTS AND DISCUSSION

**Profile characteristics of the respondents**: Majority of the TSP FLD and non-FLD tribal castor growing farmers were middle aged (35 to 55 years) and illiterate to middle school level educated (Table5.). The tribal farmers are having less farming experience in cultivation of castor crop both the TSP FLD and non-FLD tribal castor growing farmers. As far as TSP is concerned, 100 percent of the farmers belongs to schedule tribes. In case of land holdings 31 percent of farmers had 2 ha land and 69 percent of farmers had 1.0 to 2.0 ha. In respect to irrigation facilities 72 percent of the farmers had tube well irrigation, 19 percent of farmers by well irrigation and 11 percent of farmers by rainfed condition.

**Factors responsible for castor cultivation:** Suitability of the crop to the prevailing environment of the study area is the foremost factor that contributed for the initiation and spread of castor cultivation. There are other crops like tapioca, minor millets and vegetables are grown in the study area and this crop according to the respondents has less cost involved which is the second important factor that contributed for castor cultivation. Also, the damage due to pests and diseases is comparatively lower and that forms third important

factor that contributed for castor cultivation. Local availability of market enhances the further growth of castor cultivation in the study area.

**Concurrent impact of the TSP front line demonstrations:** The majority of farmers had adopted the recommended production technology. Out of which use of certified seeds, inter culturing, method of fertilizers application, use of recommended varieties, sowing method (dibbling), weed control (Cultural method) and plant protection measures were predominant than other, though all the practices got significant achievements due to TSP's implementation. The yield data of castor in demonstration plots varied from 2050 to 2230 kg/ha with maximum yield average of 2151.66 kg/ha. Similarly, minimum yield varied from 1910 to 2010 kg/ha with an average of minimum yield 1970 kg/ha when compare to local check 943.3 kgs of seed yield (Table 2; Figure 1).

**Export - Facto impact of TSP FLD' in yield and economics:** It was found that the production cost of castor varied from Rs.18,875 to 19,920 /ha with an average of Rs.19,601.66/ha of demonstration plot against the variation in cost of production from Rs.14,375 to 16,215/ha with an average of Rs.15360/ha in local check. Cultivation of castor with improved technologies gave higher net returns ranged from Rs.50,425 to 63,290/ha, with a mean value of Rs.55,998.33/ha as compared to local check with recorded Rs.18,700 to 20,185/ha with mean value of Rs.19,173.33/ha. The improved production technology registered an additional net returns ranging from Rs.31,725 to 43,105/ha with a mean of Rs.36,825/ha over local check. The average benefit cost ratio of the demonstration plot was 3.84, varying from 3.65 to 4.16 when compared to local check was 2.24, varying from 2.20 to 2.30 (Table 3; Figure 2). It can be concluded that the Tribal Sub Plan with integrated crop management proved more productive and remunerative than that grown under local practices.

**Household- and Community level Socio-Economic effects are addressed**: While tribal farmers acknowledge that the castor yield through adoption of recommended package of practices. They have created anticipated benefits, including the increase in savings and spend for fulfilling the basic amenities which not been realized before intervention and important changes in their livelihoods, including household socio-economic status, food security.

**Changes in Household Economic Status:** The economic status of households in the study communities were assessed by respondents whether they considered their households to be poorer, wealthier or the same as their neighbors in both before and after adoption of recommended package of practices for castor cultivation in their localities. This is an important line of inquiry as people are concerned about their subjective well-being, that is, people are poor if they feel poor and cannot maintain the average standard of living in the society in which they live. Fewer people felt like they were wealthier or better off than their neighbors. Approximately 42 percent of the respondents reported that they were wealthier or better off than their neighbors after adoption of recommended package of practices for castor, while 32 percent indicated the same after adoption of recommended package of practices were established. Tribal farmers respondents generally felt economically better off after the introduction of Castor (Figure 3).

**Constraints in castor cultivation**: Non–availability of good quality seeds, in shortage of electricity supply for irrigation, higher cost of labour, inconsistent rainfall pattern, changeability in the market price, soaring cost of inputs and the poor quality of the irrigation water are the most important constraints for the castor growers. In addition, injuries due to sucking pests, defoliators and fungal infections are the biotic stresses that affect castor cultivation in the study area apart from extension limitations like lack of knowledge towards improved production technology, lack of sufficient subsidy programes and wider extension personnel, farmer's ratio are to be rise above to improve the castor cultivation in the study area (Padmaiah *et al.*, 2012).

## CONCLUSION

The castor hybrid YRCH 1 developed at TCRS, Yethapur, need to be included in the seed supply chain. There is a wide scope for production of castor hybrids in collaboration with the TNAU

which ensures the timely supply of quality seeds to the castor growers of the area. Intensive training

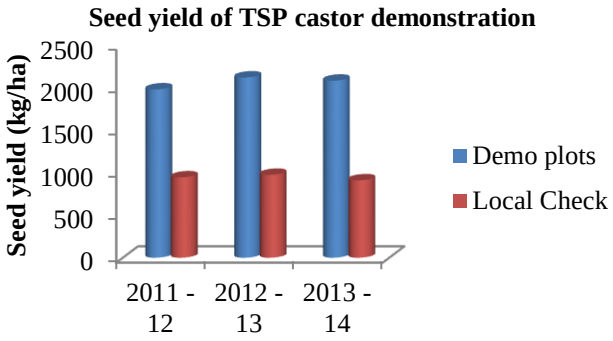


**Figure 1. Analysis seed yield castor demonstration under tribal sub plan**

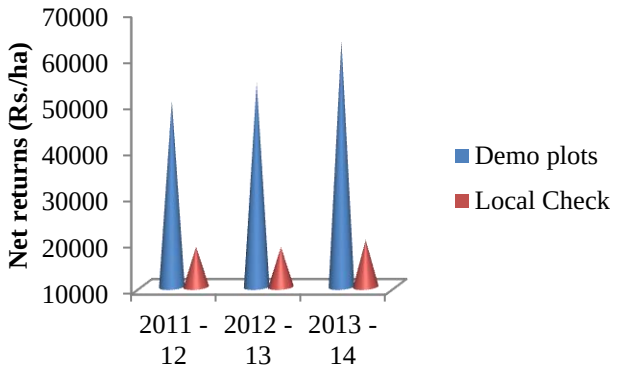


**Figure 2. Economic analysis of castor cultivation of improved technologies and local practices through Tribal sub plan**

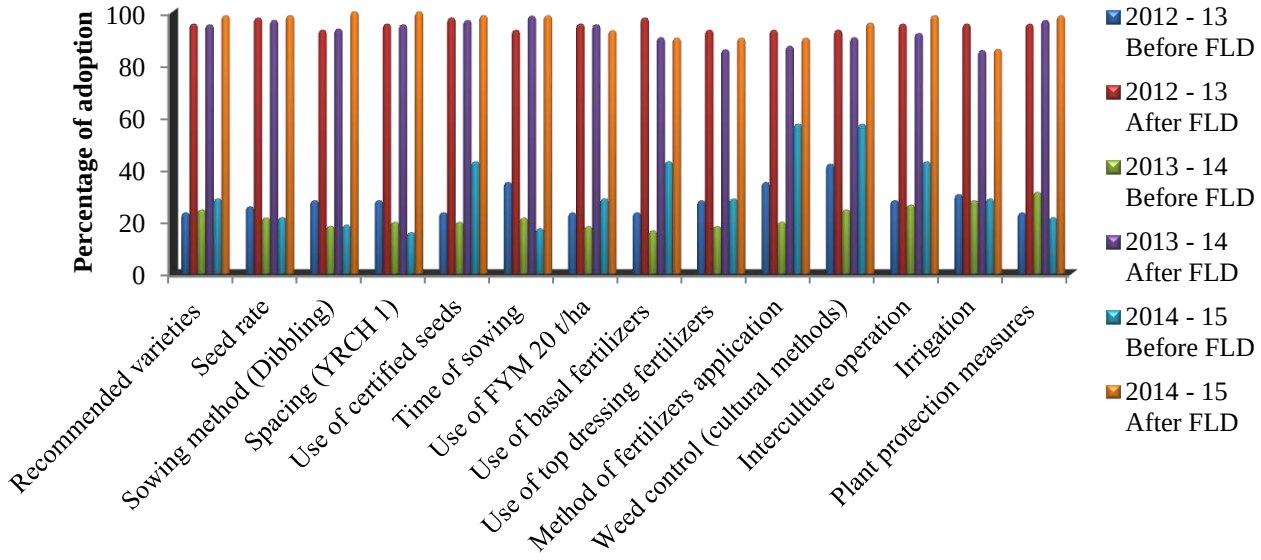


**Figure 3. Adoption of castor cultivation practices during 2012 to 2015.**

programmes need to be organized for the farmers particularly on efficient water management. Director of Agriculture should also take advantage of the expertise from KVKs and other voluntary organizations for disseminating the improved castor production technologies like integrated packages for management of insect pests and diseases, integrated nutrient management. So that the collaborative efforts will reduce the extension gap between the farmers and extension officials to better dissemination technologies.

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