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## Doubling the Cotton Farmers' Income: Economic Perspective

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Doubling the farmers' income by 2022-23 is the goal set by the Government of India to promote farmers' welfare, reduce agrarian distress and parity in the incomes. The Ministry of Agriculture and Farmers Welfare in its recent report on Doubling Farmers' Income (DFI) clarified that the income to be doubled is real income (which was adjusted for inflation) rather than nominal income (<http://agricoop.gov.in/sites/default/files/DFI%20Volume%202.pdf>). At the national level, this average income is targeted to be doubled by 2022-23. The aggregate all-India average income of an agricultural household during the base year's (2015-16) is estimated to be Rs 96,703 per year at current prices. The doubling would imply that the average farm household income would go up



### GUEST COLUMN

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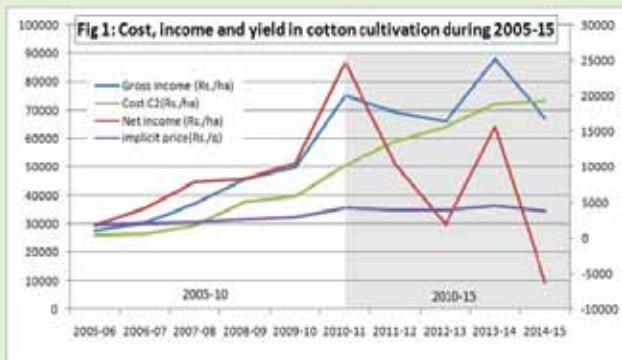
to Rs 1,93,406 measured at 2015-16 prices. The report also advised to raise the ratio of farm to non-farm income to 60:40 from the existing 70:30. If we take the existing ratio into consideration the income from farming should be about Rs. 135000 per ha per year. If we consider the projected ratio (60:40) it will be about Rs. 116000 / year. The average size of land holding of Indian farmer is 1.15 ha (as per 2010-11 census). That means a farmer should earn about Rs. 100000 / ha by 2022 from farming at the projected ratio of 60:40. This is true about cotton also.

In line with the national goal, if the income of the cotton farmers is to be doubled, the income from cotton cultivation also needs to be doubled. In 70-80% of cotton area, cotton is cultivated as a single crop. In this context the income and expenditure in cotton cultivation is analyzed to find out

where we stand now and what needs to be done to double the income from cotton cultivation.

### Current level of income:

Average gross income from cotton cultivation was Rs. 73200 / ha during 2010-15 while net income was Rs. 9259 / ha. Net income showed a negative trend during 2010-15 (fig 1) while the gross income remained stagnant. Net income



decreased from Rs. 24682 / ha during 2010-11 to Rs. 15604 / ha during 2013-14 and it was negative (Rs. 6318 / ha) during 2014-15. Under this situation can we achieve the target of achieving an income of Rs. 100000 / ha from cotton cultivation in the stipulated period? Indeed it is a herculean task. If we have to achieve the target what should be done?

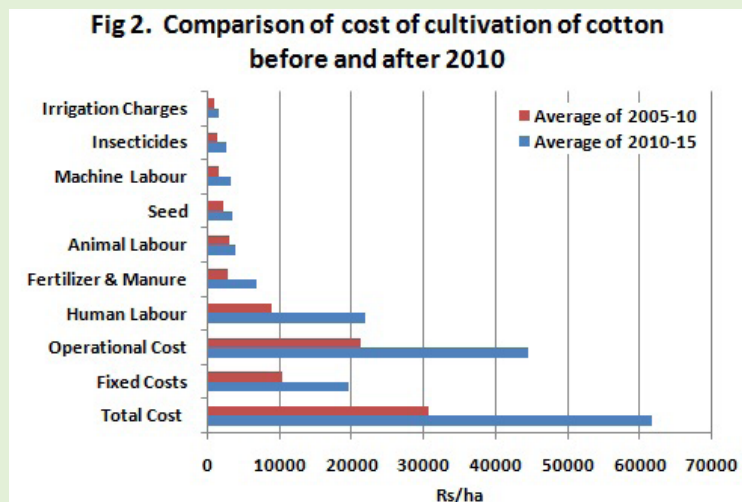
### Genesis of the current situation

Fall of the income in cotton cultivation during 2010-15 was due to stagnation in yield and prices as well as constant escalation in cost of cultivation. If we examine the costs and returns over the last decade (2005-06 to 2014-15), it is clear that the cost of cultivation of cotton escalated at a rate of about 12.8% per annum during 2005-10 as well as during 2010-15 (table 1). But during 2005-10, the positive growth in productivity and out-put price countered this increase in total cost. During 2005-10, the productivity registered a positive growth of 5.22% and the output price increased at the rate of 12.47% per annum. This made the gross and net income to increase at the rate of 17.32% and 53.54% respectively. But the situation reversed after 2010-11. Cost of cultivation continued to increase at the same rate where as productivity of cotton as well as output price remained almost stagnant. So the profit of the cotton farmers decreased and the farmers even incurred losses during 2014-15. Reversing the trend and achieving the target of doubling income made a multi pronged approach as given below.

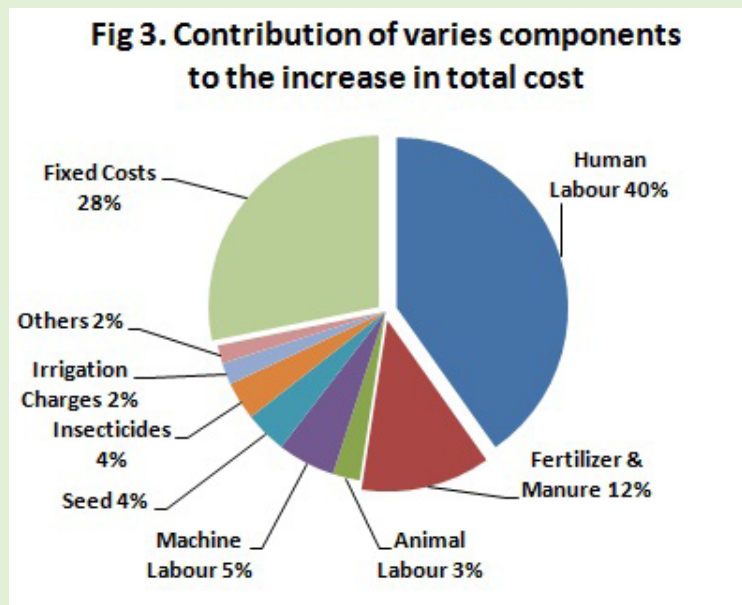
Particular	2005-10	2010-15
Gross income	17.32	0.06
Net income	53.53	-26.33
Cost of production	12.81	12.86
Output price	12.47	-0.76
Yield	5.22	0.57

### Curtail the costs

If we compare average cost of cultivation during 2010-15 (second period) with that of 2005-10 (first period), the cost of cultivation recorded 100% increase i.e., it increased from Rs. 31817 / ha to Rs. 63941 / ha (Fig 2). Seventy two percent of this increase was contributed by operational costs and the remaining 28 % was contributed by Fixed Costs. Major contributor among the operational cost was the cost of human labour,



which increased from Rs. 8964 during 2005-10 to Rs. 21916 / ha during 2010-15 i.e., 144% increase. This component alone contributed to 40 % of increase in total cost (Fig 3). But the actual quantity of human labour employed increased by 27 % only from 88 mandays /ha during 2005-10 to 112 mandays /ha during 2010-15. The major increase was due to the increase in wage rate which was about 140%. During the first period it was Rs. 88 per man day (8 hours)



which increased to Rs. 200 per man day during the second period. There may be many reasons for wage escalations. As farmers have no control on wage rates they have to curtail the quantity of human labour requirement. In cotton production picking of cotton and weeding/inter culture are the major activities which consume about 60-65% of human labour. Hence cotton picking should be mechanized to reduce the human labour consumption. For this much research efforts need to be made to devise machines suitable to Indian conditions. Cultivation of early maturing determinate type varieties where picking is early and will be over in 1-2 rounds will reduce the human labour requirement. Similarly all options for weed control, including chemical, mechanical, cultivation of cover crops, mulching should be integrated to reduce human labour consumption.

Another component among the Operational Costs which contributed to this hike is the cost of fertilizers and manures. The cost of fertilizers and manures increased from Rs. 2778 during first period to Rs. 6722 / ha during second period. This contributed 12% to increase in total cost. Nutrient consumption increased from 13kg/ha to 23 kg/ha. Similarly the consumption of manures increased from 46q/ha to 91q/ha. This coupled with the increase in prices, increased the cost of fertilizers and manures to Rs. 2778 to Rs. 6722 per ha. This needs to be reduced through cost effective technologies. Nutrient requirement should be partially met through recycling of farm waste and growing green manure / mulch crops / legume based inter crops where ever possible. Growing of early maturing, compact types would also reduce the nutrient requirement.

The other components which contributed to increase in cost of cultivation include Machine Labour, seed cost, Insecticides and Irrigation Charges. Machine Labour contributed 5% to increase in cost while cost of seed and Insecticides contributed 4% each. Irrigation Charges contributed 2% to increase in cost. All these costs needs to be reduced by adopting proper management procedures.

### Increase productivity

If we examine the productivity during 2010-15, it is almost stagnant averaging around 17 q/ha. If the cost of cultivation increases at the current rate it will become about 130000 / ha after 5years. To cover this expenditure at current level of output price of Rs. 4000/ q farmer needs to produce at

least 33 q / ha. It is almost double when compared with current level of productivity. Is it possible to double the productivity within 5 years without doubling the inputs? If we want to double the productivity what should be done. The following strategies have been suggested by the ICAR-CICR, in the project document of TMC MM II submitted to the Min. Of Textiles, Govt of India.

- IPM/IRM based Pest management with a special emphasis on pink boll worm and whitefly.
- New short duration varieties and hybrids (Bt. variety, ELS cotton, Desi variety and Bt. hybrid).
- Weed management: Pre-emergence Pendimethalin and Turga Super.
- Row direction: North-South directional planting.
- High density planting (HDPS).
- Moisture conservation: Broad bed and furrow / Ridge and furrow system, Cover crop and mulching.
- Soil test based Nutrient Management (right rate, right time, right method and right type).
- Canopy management with tested chemicals (Ethrel and mepiquat) coupled with manual methods of clipping wherever possible.
- Drip irrigation wherever possible with polymulch.
- Mulching - plastic or biological and cover crops.

Further Indian cotton needs to be made competitive in the international markets so that the increased output may be siphoned out through exports to avoid negative impact on the domestic prices.

### Price support

Output price is very important aspect which has direct impact on the income of the farmers. The growth of the cotton prices did not match with the growth of production costs during 2010-15. Rather they were stagnant during this period. The minimum support prices fixed by the government were low and in most of the years they were lower than the cost of production.

Price should be at such a level where a farmer who is producing at national average



productivity level should get the average targeted income of Rs. 100000 / ha. As the average cotton productivity is about 17 q / ha, if the farmer has to get Rs. 100000 income the price should be about Rs. 6000 / q of seed cotton. But at current level it is about Rs. 4000 / quintal. MSP fixed by the government during 20017-18 is also in the range of Rs. 4220 – 4320 / q for varies qualities and grades. The announcement of the fixing of MSP at 1.5 times of the cost of production by the Govt. of India is a welcome move in this direction. Cost of production varies widely from state to state and situation to situation. There is a difference of about Rs.2000 per q between highest and lowest cost of production. In these situations whether single MSP to all states is relevant or not is debatable. Implementing this with the existing limited procurement facilities is a big task before the government. Further cost escalation in the value chain needs to be considered while implementing this policy.

### Value addition to the Cotton Stalks

In India, around 30 million tonnes of cotton stalks are produced annually, and less than 10 % of the stalks are put to commercial use. The briquettes and pellets made from the cotton stalks can be used as boiler fuels in many industries, brick kilns, and gasification. The stalks used in

briquetting and pelleting would fetch about Rs 2000/tonne of stalk. About 2.5 tonnes of stalk is produced in one ha of cotton field which will give about Rs. 5000 additional income if this is utilized for briquettes and pellets making. Cotton stalks can be utilized for bio-enriched compost preparation and oyster mushroom cultivation. The burden of collection and logistics of cotton stalks from the field limits its uses in Industrial application. These can be taken as an entrepreneurial activity by the farmers to fetch additional income from cotton cultivation.

### Conclusions

It is clear from the above analysis that the current level of income from cotton cultivation is very low and showing negative trend. The main factors behind this are increasing cost of cultivation coupled with stagnant productivity and output price levels. To achieve the targeted income by the year 2022, it is necessary to limit the growth in production costs as well as increase the productivity by utilizing all possible means. It is also very important to keep the prices at a level where farmers will get profits.

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*(The views expressed in this column are of the author and not that of Cotton Association of India)*