

## Agrarian Crisis – Part-2

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What can drive a farmer to take a step as extreme as suicide? During one of my recent visits to a village near Wardha, an old man remarked 'If poverty was a reason for suicides, crores of Indians would have killed themselves all through these hundreds of years. It is not poverty that can kill any of us. It is the cumulative failure of high expectations that drives farmers to despair'. He pointed out to the long narrow stony road and said, 'For 30 years now, I have been carrying cotton on my bullock cart on this 15 km stretch to reach the main road. The nearest mill is another 20 km from there. I only hear promises year after year, but neither my road nor my journey gets any better'. That summed it all. Indeed, the cotton farmer's journey is getting tougher by the day, at least in Maharashtra.

This second part of the article examines the factors in cotton farming that may have caused distress. New technologies certainly lead to renewed hope and high expectations. Many farmers associate high income with high investment in farm inputs. High investment and low returns can easily cause indebtedness, disappointment and distress. Successive crop failures due to weather vagaries such as drought, delayed onset of monsoon and hail-storms cause immense distress. A critical analysis of the data available on the official web site <http://eands.dacnet.nic.in/> of the Directorate of Economics and Statistics (DES) of the Ministry of Agriculture, GOI showed that compared to all cotton growing states in the country, the average annual profits were the lowest in Maharashtra. The cost of cultivation sky rocketed in recent times and net returns plummeted to abysmal depths. The DES data showed that over the nine year period of 2003 to 2011 the average annual net profits on cotton cultivation in Maharashtra were Rs. 382 for an investment of Rs. 10,000. If a farmer invested one lakh he would get a net profit of Rs. 3,820 at the end of the cropping season. Can this support livelihood?

Several surveys have been conducted in recent times to analyze the economic impact of cotton

cultivation in various parts of India. There are at least a dozen research papers on the subject, most of them on the possible positive impact of Bt-cotton in recent years. The data presented in these papers were mainly derived from village visits and sample surveys. This article deals with results analyzed from the Government data 1996-97 up to 2011-12 available on <http://eands.dacnet.nic.in/> The data include details on the cost of cotton production to the best possible extent on all the key components.

Some important questions have been raised from time to time on the recent rising costs of cotton production after the introduction of Bt cotton, as the possible cause of distress. These questions are primarily related to enhanced cost of seeds, increased labour wages, increased insecticide and fertilizer usage, stagnant yields and declining net profits which are most likely

to have a strong influence on farmer livelihood and agrarian crisis. Many authors and researchers attempted to connect farmer suicides with cotton cultivation, at least in two major cotton growing states i.e Maharashtra and Andhra Pradesh. Indeed, as mentioned in the part-1 of my article in the CAI Newsletter (27 Jan 2015) compared to other crops, cotton is likely to have a major impact on farmer livelihood in states where the crop occupies substantially larger proportion of the cultivated area. For example, cotton occupies 25% of Gujarat's agricultural

area, 20.9% of Maharashtra's cultivated area; 16.8% of the agriculture area in erstwhile Andhra Pradesh (including Telangana); 16.8% of Haryana's cultivated area and 12.0% of the cultivated area in Punjab. In rest of the cotton growing states, cotton is cultivated in less than 4.0% of the cultivated area and is unlikely to be the sole factor in any major impact that agriculture may have on the farming community. Therefore it is possible that compared to other crops, the economics of cotton cultivation in Maharashtra, AP, Gujarat, Haryana and Punjab may have a stronger impact on farmers' livelihood. However, as mentioned in the part-1 of the article, the annual numbers of farmer suicides over the past 10 years in Maharashtra (3685 suicides) and AP (2440 suicides) are significantly higher compared to the significantly lesser annual average number of suicides during 2004-2013 in Gujarat (530), Haryana (238) and Punjab (79). Thus it is important to examine the factors that may have been responsible for the agrarian distress in Maharashtra and Andhra Pradesh.

### EXPERT'S Column



Dr K.R. Kranthi

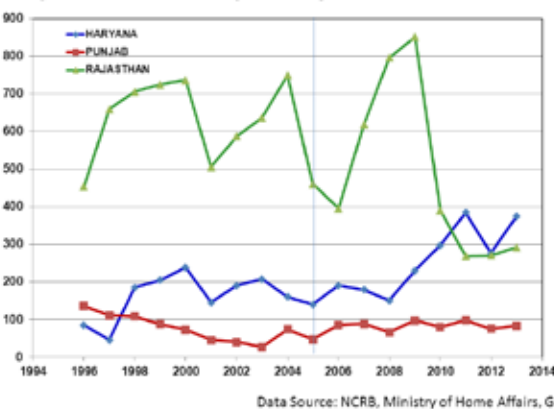
### Farmer suicides over the past decade

An annual average number of 15,369 cases of farmer suicides were reported across the 10 cotton growing states during the nine years period from 1995 to 2003, prior to the introduction of Bt cotton in India. During the subsequent 10 years from 2004 to 2013 the average number of farmer suicides was 15,815. Thus the data show a marginal overall 3.0% increase in the number of suicides over the past 10 year period compared to the decade prior to 2003. The annual average number of suicides declined in seven cotton growing states during the past 10 year period as compared to the previous decade (graphs 1 to 3). The decrease was 31% in MP, 29% in Tamilnadu, 28% in Odisha, 15% in Karnataka,

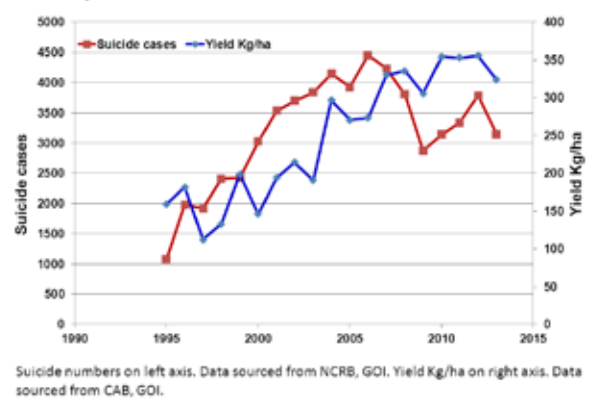
8% each in Rajasthan and Gujarat and 2% in Punjab. However, it must be noted that despite increase in the yields there was 39% increase in Maharashtra (graph 4) and 51% increase in erstwhile Andhra Pradesh (graph 5) and in the annual average number of suicides during 2004-2013 compared to 1995-2003. It is important to elucidate the possible reasons for the increase in suicides.

As mentioned in the introductory paragraph, amongst all cotton growing states in India, the net returns from cotton cultivation are the lowest in Maharashtra. The cost of cultivation at Rs. 61,907 in 2011-12 ranks amongst the highest with dismally pathetic net profit of Rs. 3.82 per Rs. 100 invested on

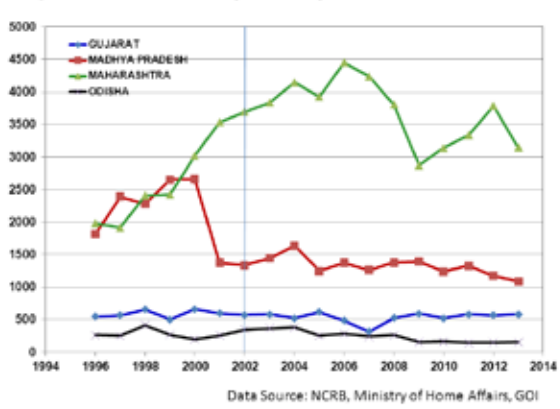
**Graph 1. Farmer Suicides (Numbers) in North India 1995-2013**



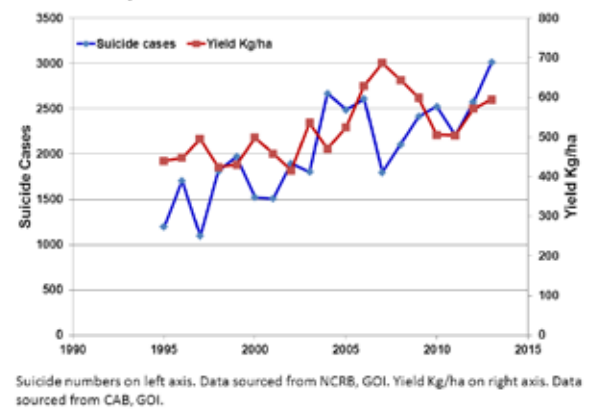
**Graph 4. Suicide Cases & Yield in Maharashtra 1995-2013**



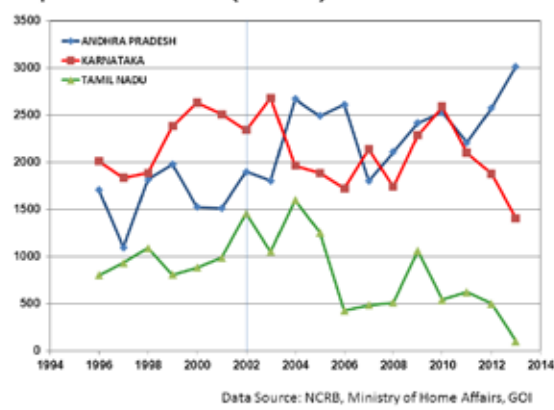
**Graph 2. Farmer Suicides (Numbers) in Central India 1995-2013**



**Graph 5. Suicide Cases & Yield in AP 1995-2013**



**Graph 3. Farmer Suicides (Numbers) in South India 1995-2013**



cotton cultivation. The following passages examine the factors responsible for the high cost of cotton cultivation and lowest net returns in Maharashtra.

### Has chemical usage increased in cotton?

It is a well known fact that hybrids need higher chemical inputs for high yields. Interestingly, out of the 80 cotton growing nations, India is the only country to cultivate hybrid cotton, and that too in 95% of its total cotton acreage. The area under hybrid cotton in India was 40% in 2003, but increased to 95% in 2011 after the Bt technology was restricted only to hybrids. During this period, insecticide usage increased by a staggering 8.9 fold in Gujarat and to

the extent of 5.2 fold in Maharashtra (table 4). In other major cotton growing states, insecticide usage more than doubled over the 6-8 years prior to 2011. This is actually surprising because the area under Bt cotton increased from a negligible 1.0% in 2003 to about 92% in 2011. Bt-cotton is a 'plant protection' technology meant for effective control of bollworms. Before the introduction of Bt-cotton in 2002, as much as 90% of the total insecticides used on cotton were directed for bollworm control. Extensive use of the technology on a large scale to an extent of 92% area by 2011 was expected to eliminate the need for insecticide use for bollworm control. Why then did the insecticide usage increase several-fold in all the major cotton states despite the rapid increase in area under Bt-cotton from 1% to 90% over the period 2003-2011? Bt-cotton technology is only meant to control bollworms and other caterpillars. It does not control the sap-sucking insects which generally cause higher levels of damage to hybrid cotton. Majority of the Bt cotton hybrids are highly susceptible to sap sucking insects and more than 1000 hybrids were approved for commercial cultivation during the period 2006-2011, which led to the multi-fold increase in the insecticide usage in cotton fields.

Similarly, the fertilizer usage (table 4) increased from 8.4 lakh tonnes in the base year to 25.7 lakh tonnes by 2011-12. As compared to the year 2002, the quantity of fertilizer usage in 2011 increased by 5.8 fold in Gujarat, 4.3 fold in Maharashtra, 4.2 fold in Karnataka and 2.5 fold in Andhra Pradesh.

The monetary value of fertilizers also increased exorbitantly to the extent of more than double in six states and more than five-fold in four of the six states.

Clearly, saturation of cotton acreage with hybrid technology resulted in the need for excessive input usage, which in turn led to increased input costs. It is important to note that the 'Bt-cotton' technology was restricted only to hybrids in India and not in varieties, as is the case in the rest of the world. Though hybrid technology was developed in 1971, the hybrid area in India never crossed more than 40% until 2002, when the total number of cotton hybrids released until then was just about 40. 'Bt-cotton' was approved in India for commercial cultivation in 2002. During 2006-2011 more than 1000 hybrids were approved for commercial cultivation in India. The use of chemical fertilizers and insecticides increased multi-fold during this period.

### Increased cost of cultivation

Cost of cultivation has increased over the past few years because of four major input components, namely seed, fertilizers, pesticides and labour. The cost of cultivation in 2011 was Rs. 61,659 in AP and Rs. 61,907 in Maharashtra. It is pertinent to note that more than 95% of the cotton area in Maharashtra is primarily dependent on rains and more than 82% area in erstwhile AP is under rain-fed cultivation. The cost of cultivation in these two states with such vast areas under rain-fed cotton is more of a gamble and points out to high risks. Such investment is beset

**Table 4. Impact of cotton hybrids on chemical usage**

	Insecticide usage Rs Crores			Fertilizer usage Rs Crores			Fertilizer Lakh tonnes		
	Base year**	2011**	x-fold change	Base year*	2011**	x-fold change	Base year*	2011**	x-fold change
Punjab	117	317	2.7	111	181	1.6	0.93	1.29	1.4
Haryana	100	121	1.2	77	129	1.7	0.60	0.81	1.3
Rajasthan	49	130	2.7	64	162	2.5	0.33	0.63	1.9
Gujarat	83	743	8.9	256	1837	7.2	1.11	6.50	5.8
Maharashtra	174	900	5.2	487	2788	5.7	2.59	11.19	4.3
MP	69	137	2.0	82	177	2.2	0.59	0.65	1.1
AP	279	508	1.8	236	1184	5.0	1.76	4.40	2.5
Kar	24	50	2.1	37	252	6.8	0.22	0.90	4.2
TN	25	20	0.8	49	85	1.7	0.31	0.33	1.1
	920	2926	3.18	1399	6795	4.86	8.44	26.7	3.16

\*Base year = Year of Bt cotton approval. 2002 for Central and South India; 2005 for North India.

\*\*2011-12: Area under Bt cotton was >90%

**Table 5. Cost of cultivation, net profits and rate of suicides**

	Cost of cultivation Rs per hectare			Net Profit Annual Average Rs per hectare			Annual Average of Suicide numbers per year		
	Base year <sup>v</sup>	2011 <sup>**</sup>	x-fold change	1996-2002	2003-2011	Difference	1995-2003	2004-2013	Difference
Punjab	33983	66698	1.96	-1448	13515	14964	81	79	-2
Haryana	26738	62330	2.33	498	12997	12499	164	238	74
Rajasthan	17594	56097	3.19	5850	26242	20391	556	509	-47
Gujarat	23396	58388	2.50	2277	17274	14997	578	530	-48
Maharashtra	20990	61907	2.95	-1104	1867	2971	2656	3685	1029
MP	18664	42289	2.27	-1642	8433	10075	1910	1312	-598
AP	36202	61659	1.70	1815	6421	4606	1613	2440	827
Kar	11126	45077	4.05	299	6081	5782	2305	1968	-337
TN	34386	61319	1.78	-3305	1880	5186	1000	710	-290

<sup>v</sup>Base year = Year of Bt cotton approval. 2002 for Central and South India; 2005 for North India.

<sup>\*\*</sup>2011-12: Area under Bt cotton was >90%

with lesser risk in the 100% irrigated cotton of North India. Similarly, high investment of Rs. 58,388 in Gujarat and Rs. 61,319 in Tamilnadu are not prone to higher risks because of the 40-50% area under irrigation in the two states.

Bt cotton was approved in 2002 for commercial cultivation in Central and South India, and 2005 for cultivation in North India. In the first year of approval, the area under Bt cotton was almost negligible and thus 2002 was considered as the base year for Central and South India and 2005 for North India. By 2011-12, Bt cotton occupied more than 92% of the cotton area in India. Thus, it would be an appropriate assumption to consider the difference in input usage between 2011 and the base year is a result of the impact of Bt cotton.

The cost of cultivation (table 5) increased by 1.96 to 3.2 fold in North India in six years after the introduction of Bt cotton in 2005. The cost of cultivation in Central and South India increased significantly by 2011 after nine years of Bt cotton introduction. The increase was 1.7 to 1.78 fold in erstwhile AP and Tamilnadu and 2.27 to 2.95 fold

increase in Maharashtra, MP and Gujarat. However, the four- fold increase in the cost of cultivation in Karnataka is a major concern.

### Conclusion of Part-2

It is clear that the ever increasing 'cost of cultivation' coupled with yield uncertainties and declining net profits from rain-fed cotton farming are causing distress over the past few years. The introduction of 'Bt-cotton' certainly increased the profit levels, especially in the irrigated regions, where the stress levels have always been low. But did the technology prompt increased use of inputs? This needs to be examined more critically in Maharashtra, Telangana and Karnataka where cotton farming is predominantly rain-fed and high cost of cultivation can easily drive farmers towards distress. In the next part, I will deal with the specific factors that contributed to high cost of cultivation; what causes the distress and the possible solutions to the vexed problem of farmer suicides in rain-fed cotton farming regions of India.

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