

## **CASHEW CROP LOSS OF THANE CYCLONE IN PANRUTI BLOCK, CUDDALORE DISTRICT, TAMIL NADU**

**By**

**Dr. K. DAMODARAN**

Assistant Professor

Department of Economics

Annamalai University

Annamalai Nagar – 608 002

Chidambaram, Tamil Nadu

India

### **Abstract**

The severe cyclonic storm 'thane' has created huge damages in Tamil Nadu in month of December 2011. The cyclone has highly affected the cuddalore district and the study analyses the cashew crop losses in the district. Since cashew trees are long term crops, the investment is high and similarly the loss. The data is collected in month of January 2013 among various farm groups. The results infer that the loss is high where the Government relief funds to the farmers are not sufficient. The farmers expect additional relief funds, free saplings, free manure, waive land tax for ten years and agriculture loans for lands.

**Keywords:** cyclone, crop loss, rehabilitation cost, relief measures

### **Introduction**

The present study makes an attempt to assess the cashew crop loss of thane cyclone in Panruti block, Cuddalore district. Population growth, air and water pollution from industrial activities, conversion of forest land for agriculture, settlements and industry and unsustainable development are some of the major causes of the environmental problems we face today. Human society and the natural environment have become increasingly vulnerable to natural hazards, such as earthquakes, hurricanes, droughts, and flooding. Natural hazards such as cyclones and earthquakes do not have to become natural disasters. With proper planning, including proper environment management, much of the risk can be reduced (Okuyama, 2003). Since the present study assess the impact of Thane cyclone, the forthcoming section gives the details of the same.

### **Types of Cyclone**

Cyclones are caused by atmospheric disturbances around a low-pressure area distinguished by swift and often destructive air circulation. They are usually accompanied by violent storms and bad weather. Cyclones are classified as: (i) extra tropical cyclones (also called temperate cyclones); and (ii) tropical cyclones. Extra tropical cyclones occur in temperate zones and high latitude regions, though they are known to originate in the Polar Regions. The World Meteorological Organization uses the term 'tropical cyclone' to cover weather systems in which winds exceed 'gale force' (minimum of 63 Kph). Tropical cyclones are the progeny of ocean and atmosphere, powered by the heat from the sea (Nelson, 2012).

## Thane Impact and Damages

The severe cyclonic storm 'thane' has created huge damages in Tamil Nadu in month of December 2011. Besides Cuddalore, deaths have been reported from Villupuram, Tiruvallur, Kancheepuram, Chennai and Theni. Seven people died in Puducherry. The cyclone has resulted in extensive damage with the loss being estimated at over Rs 2,000 crore. Cyclone Thane had not only a severe impact on population with all the modes of communication had cut off, trees were uprooted. The cyclone has resulted in extensive damage with the loss being estimated at over Rs 2,000 crore (CCFID, 2012). The major Cashew trees (23,500 ha) in the blocks of Panruti, Annagramam, Vridhachalam, Cuddalore and Kurinjipdai were either completely uprooted or partially uprooted. In addition, the branches were also damaged with complete leaf shedding. Given this backdrop, a fresh study has been taken up to analyze the cashew crop loss in Panruti block of Cuddalore district.

## Crop Loss

Cashew crop is a long term crop where keen management is required for number of years. At present, the cashew trees are uprooted due to Thane cyclone, which incurs huge loss and costs to the farmers. Cashew yield from an acre may be around six gunny bags (80 kgs), which may be sold for Rs. 42,000 at the rate of Rs. 7000 per bag. Per acre cost of cultivation may be Rs. 10,000 and the net income from an acre is Rs.32, 000. But, at present, the cashew cultivation is completely affected by Thane cyclone. Roughly, with the damaged cashew trees, the farmers may yield around two gunny bags and has to wait for ten more years to regain the actual yield. The Government just created a small intervention in the time of cyclone and turned to their routine affairs. The Government gave only Rs. 2500 per acre for the loss created by the cyclone. But, the cyclone has created an unforgettable event to the cashew farmers in particular, which may prolong for a decade to come. Thus, the present study raises the question "What is the cashew crop loss created by the Thane cyclone and its long term impact on farmer's livelihood?"

## Methodology

In order to measure the cashew crop loss due to thane cyclone, Panruti block is selected from the Cuddalore district. Since cashew cultivation is high in the Panruti block of the surveyed district, the villages are selected from the block where cashew cultivation is high. For selecting the villages, the researcher has approached the Block Development Office and villages viz., Kadampuliyar and Marangur where cashew cultivation is high are selected as per the instructions given by the officials. From each village, 60 households are selected and 120 respondents are chosen for the study. Since the productivity of cashew crop varies between the farm sizes, the loss may be also in the same pattern. Thus, the researcher has chosen the sample farmers from four categories, viz., Marginal, Small, Medium and Large farmers. Secondary data is collected from the records of the village Panchyat, Block Development Office and District website. The primary data is collected in month of January 2013.

## Tools of Data Collection

A structured household interview schedule was employed to collect primary data from the sample households. The schedule was prepared after conducting an intensive pilot study in the study villages. The structured interview schedule was pretested and finalised. The pilot study helped the

researcher to understand the various losses incurred due to Thane cyclone in the study villages. The schedule was administered through personal interviews with most knowledgeable person of the household chosen.

## Data Processing and Analysis

The primary data were collected through field survey with structured interview schedule. Statistical Package for Social Science (SPSS) was used in addition to Ms Excel for data processing, analysis and tabulation. Multiple Linear Regression model is used to analyse the cashew crop loss and rehabilitation costs. Besides, simple statistical measures such as averages and percentages are also used extensively for analysis.

## Loss Created by Thane Cyclone

The cyclone has created various losses in the Cuddalore district. The below table 1 gives the details of loss due to thane in the surveyed villages.

**Table 1 Loss Incurred due to Thane Cyclone in the Surveyed Village**

Details (in Rs.)	Farm Size				
	Marginal	Small	Medium	Large	Total
	(n=30)	(n=30)	(n=30)	(n=30)	(N=120)
House	2183 (49.4)	2591 (48.4)	3743 (51.2)	4199 (38.2)	3179 (45.3)
Livestock Hut	891 (20.2)	1032 (19.3)	1535 (21.0)	2257 (20.6)	1429 (20.4)
Trees	539 (12.2)	638 (11.9)	895 (12.3)	1099 (10.0)	793 (11.3)
Fencing	492 (11.1)	558 (10.4)	611 (8.4)	1637 (14.9)	825 (11.8)
Others	313 (7.1)	531 (9.9)	522 (7.1)	1790 (16.3)	789 (11.2)
Total	4418 (100)	5350 (100)	7306 (100)	10982 (100)	7014 (100)

Source: Computed

Note: Figures in parentheses denotes percentages to total

The surveyed farmers report that cyclone has damaged their house, livestock hut, trees, fencing and others. On an average, the loss is Rs. 7014 where 45.3 per cent loss is due to house damage. Next to this, livestock hut, fencing and trees are damaged in the surveyed villages. As the economic status of the farmers varies according to the farm size, the loss also varies accordingly. That is, large farmers own more assets in form of house, trees, livestock hut etc., and the loss is also registered accordingly. However, the large farmers can manage the loss to some extent where marginal and small farmers could not bear the loss.

## Per Acre Loss of Cashew Cultivation

Cashew crop loss created by the thane cyclone is computed and the details are given in the table 2. Cashew yield loss, tree loss, damage of bunds, fencing loss and others are the various losses in the cashew crop cultivation.

**Table 2 Loss of Cashew Cultivation (per acre) due to Thane Cyclone in the Surveyed Villages**

Details (in Rs.)	Farm Size				
	Marginal	Small	Medium	Large	Total
	(n=30)	(n=30)	(n=30)	(n=30)	(N=120)
Cashew Yield Loss	10571 (35.4)	9935 (36.3)	9036 (34.8)	8591 (36.2)	9533 (35.7)
Tree Loss	15852 (53.0)	14338 (52.4)	14021 (54.0)	12537 (52.8)	14187 (53.1)
Damages of Bunds	2519 (8.4)	2164 (7.9)	2011 (7.8)	1946 (8.2)	2160 (8.1)
Fencing Loss	525 (1.8)	508 (1.9)	485 (1.9)	415 (1.7)	483 (1.8)
Others	428 (1.4)	412 (1.5)	388 (1.5)	269 (1.1)	374 (1.4)
<b>Total</b>	<b>29895</b> (100.0)	<b>27357</b> (100.0)	<b>25941</b> (100.0)	<b>23758</b> (100.0)	<b>26738</b> (100.0)

Source: Computed      Note: Figures in parentheses denotes percentages to total

On an average, Rs. 26, 738 is the loss per acre and the tree loss and yield loss is high as compared to other losses. Among the farm groups, the loss is high for the marginal and small farmers as compared to medium and large farmers. Since the marginal and small farmers manage the crops effectively and invest more on cashew cultivation as compared to medium and large farmers. As a result, the loss is high for marginal and small farmers.

## Cashew Loss Estimation for Five Years

The researcher has analysed the cashew loss estimation for five years. Since cashew is a long term crop; yield loss will be for five years. The loss is computed from 2012 to 2016 and the details are given in the table 3. For the 120 surveyed farmers, the total loss for the period (2012-2016) is Rs. 2, 86,349 and the loss is Rs. 1, 26,253 in 2012, which comes to Rs. 21, 392 in 2016. That is, the loss is high in the initial stage and the cashew cultivation slows increases where the loss comes down in the long run. Among the farm groups, the loss is high for the marginal and small farmers as compared to the medium and large farmers. Since productivity depends on the farm size, this variation is registered.

**Table 3 Loss Estimation (for Five Years) of Cashew Cultivation due to Thane Cyclone in the Surveyed Villages**

Details (in Rs.)	Farm Size				
	Marginal	Small	Medium	Large	Total
	(n=30)	(n=30)	(n=30)	(n=30)	(N=120)
2012	57398 (44.0)	97391 (43.4)	152792 (43.2)	197429 (44.8)	126253 (43.9)
2013	24960 (19.1)	42720 (19.0)	64790 (18.3)	87255 (19.8)	54931 (19.1)
2014	19200 (14.7)	33820 (15.1)	54777 (15.5)	75621 (17.2)	45855 (16.0)
2015	16320 (12.5)	28836 (12.8)	46531 (13.2)	63987 (14.5)	38919 (13.5)
2016	12480 (9.6)	21716 (9.7)	34751 (9.8)	16620 (3.8)	21392 (7.4)
<b>Total</b>	<b>130358</b> (100.0)	<b>224483</b> (100.0)	<b>353641</b> (100.0)	<b>440912</b> (100.0)	<b>287349</b> (100.0)

Source: Computed

Note: Figures in parentheses denotes percentages to total

### Fitted Multiple Linear Model for Assessing Loss

The table 4 analyses the various losses such as tree loss, cashew crop loss, damages of bunds, fencing loss and other losses. The various losses are computed in Rupees and those are the explanatory variables where farm size is dependent variable. The farm size is classified as marginal, small, medium and large farmers. The first hypothesis reads as “Cashew tree loss due to Thane cyclone is higher than the other losses (yield loss, damages of bunds and fencing loss) in cashew cultivation. The hypothesis highlights the costs that impose heavy loss due to thane cyclone. The nature and extent of the loss are tested individually for each farm groups by using Multiple Linear Regression Model (MLRM). The fitted regression model is found to be fit. The F ratio is significant at 5 per cent level in all the farm groups. The adjusted R square, the coefficient of determination, shows variation among the various losses. Of this, the loss is high in tree loss as compared to other losses. Thus, the first hypothesis that cashew tree loss due to Thane cyclone is higher than the other losses (yield loss, damages of bunds and fencing loss) in cashew cultivation is proved.

Table 4 Loss in Cashew Cultivation due to Thane Cyclone:

## Multiple Linear Regression Model

Sl. No.	Loss	Estimated Marginal Effects ( $\beta$ Value)				
		Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	All
1.	Tree Loss	0.99 * (15.00)	0.99 * (38.71)	0.98 * (25.50)	0.98 * (59.50)	0.54 * (2.60)
2.	Cashew Yield Loss	0.39 * (8.87)	0.85 * (20.57)	0.45 * (11.55)	0.48 * (7.28)	0.35 * (2.27)
3.	Damages of Bunds	0.35 * (3.25)	0.18 * (14.28)	0.02* (0.04)	0.11 * (3.26)	0.10 * (0.98)
4.	Fencing Loss	0.003 (0.49)	0.001* (0.13)	0.003 * (0.61)	0.01* (0.05)	0.01 * (0.80)
5.	Other loss	0.003 (0.09)	0.003 (0.18)	0.01 * (0.33)	0.03 (0.00)	0.00 (0.04)
Adjusted R <sup>2</sup>		0.91	0.87	0.79	0.89	0.92
F- value		6.02 *	1.25 *	1.90 *	3.42 *	9.04 *

Source: Computed Note: Figures in parentheses are t statistic

\* Significant at 5 per cent level

## Conclusion and Policy Suggestions

The surveyed farmers report that cyclone has damaged their house, livestock hut, trees, fencing and others. Besides, cashew crop losses are in terms of cashew yield loss, tree loss, damage of bunds, fencing loss and other losses. Among the farm groups, the loss is high for the marginal and small farmers as compared to medium and large farmers. Since the marginal and small farmers manage the crops effectively and invest more on cashew cultivation as compared to medium and large farmers. As a result, the loss is high for marginal and small farmers. The loss is computed from 2012 to 2016 and the loss is high in the initial stage and loss comes down in the long run since cashew cultivation increases every year. Among the farm groups, the loss is high for the marginal and small farmers as compared to the medium and large farmers. Since productivity depends on the farm size, this variation is registered.

After a huge disaster of Thane cyclone, the farmers have to clear the trees from the cashew farms. For clearing the trees labour cost is involved and transportation is also required. Thereafter, cost is required for new saplings, fencing and irrigation. Clearing trees involves huge cost and other costs require comparatively lesser amounts. As a whole, the cashew crop loss is high and the severity of loss and cost is more for small and marginal farmers. But, the government's action towards the problem is not up to the expectations of the framers. The farmers expect additional relief funds, free saplings, free manure, no land tax for ten years and agriculture loan for lands. Irrespective of farm size, majority of the farmers expect the above demands from the government.

## References

- Burton, Horace H.P. and Selvin Dec Burton (1999), "Impact of Tropical Cyclones", <http://www.oas.org/en/cdmp/>
- Cochrane, Halord C. (2004), "Chapter 3. Indirect Losses from Natural Disasters: Measurement and Myth," in Yasuhide Okuyama and Stephanie E. Chang eds. *Modeling the Spatial and Economic Effects of Disasters*, New York, NY; Springer.
- Community Collective Society for Integrated Development (CCFID) (2012), "Cyclone Thane: Impact Assessment Report", Cuddalore.
- Guin, Jayanta and Vinita Saxena (2010), "Extreme Losses from Natural Disasters - Earthquakes, Tropical Cyclones and Extratropical Cyclones", Applied Insurance Research Inc., 101 Huntington Ave, Boston, MA 02199, [jguin@air-worldwide.com](mailto:jguin@air-worldwide.com), [vsaxena@air-worldwide.com](mailto:vsaxena@air-worldwide.com)
- Lynch, Jared (2011), "Farmers face crop losses of \$1 billion", <http://www.smh.com.au/small-business/farmers-face-crop-losses-of-1-billion-20110203-1aeuf.html>
- National Cyclone Risk Mitigation Project (2010), "Cyclones and their Impact in India", <http://ncrmp.gov.in/ncrmp/>
- Nelson, Stephen A (2012), "Natural Disasters and Assessing Hazards and Risk", Tulane University.
- Okuyama, Yasuhide (2003), "Economics of Natural Disasters: A Critical Review", Paper presented at the 50th North American Meeting, Regional Science Association International November 20-22, 2003, Philadelphia.
- Pielke Jr., R. A., J. Gratz, C. W. Landsea, D. Collins, M. A. Saunders, and R. Musulin (2008). "Normalized Hurricane Damages in the United States: 1900–2005", *Natural Hazards Review* 9 (1): 1–29.
- SEARCA (2012), "Rebuilding Myanmar's Agriculture after Cyclone Nargis", <http://beta.searca.org/searca/index.php/>