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A Study on the Impact of Flood on Financial Performance of Listed Cotton Companies in India

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Abstract:

India has got a slow but growing demand for cotton consumption yearly. The production pattern of cotton has got both organised and unorganised players in the market. This industry employs around 4.8 million people in India. The study focuses on understanding the effects of flood on the listed cotton companies in India. The performance of the listed cotton companies would be studied with regards to impact on their share prices. The calamity selected for the present study was flood in the year 2013 and therefore Share price returns were calculated for a year where prices were taken on 1st January, 2012 and 31st December, 2012 and return was calculated. The share price returns for after the calamity were taken by taking prices of 1st January, 2014 and 31st December, 2014.The study would help in giving various stakeholders an idea with regards to the key performance drivers. Secondary data has been collected from annual reports and stock exchanges of the selected sample companies. The study has used the paired sample t test to study the impact of flood on the cotton companies. The result of the study is that cotton companies have been affected due to flood and significant relation between cotton production and returns of listed cotton (Textile) companies have been found.

Keywords: *cotton crop, financial performance, listed companies, profitability*

Introduction:

Cotton is widely used input for multiple industries pertaining to varieties of cloth and cloth material. The cotton production is expected to reach at a level of 371 lakh bales in the near future with yield per hectare of 486.76 kgs and area under production of 129.57 lakh hectares as per the meeting held by Committee on Cotton Production and Consumption (The Cotton Corporation of

India Ltd., 2021).Cotton is a cash crop which is widely grown in India. It is one of the major agri-input for the various industries. Cotton provides employment to 6 million farmers and other 40 to 50 million are employed in cotton trading and processing. India is divided into Northern, Central and Southern zones concerning cotton production. India cultivates 4 species of cotton which are Gossypiumarboreum, G. herbaceum, G. hirsutum and G. barbadense. (Government of India, n.d.)Major cotton producing states are as follows:(The Cotton Corporation of India Ltd.,2021)

Name of the State	2018-19 Area (Lakh ha)	2019-20 Area (Lakh ha)	2020-21 Area (Lakh ha)	2018-19 Production (lakh bales)	2019-20 Production (lakh bales)	2020-21 Production (lakh bales)
Punjab	2.68	2.48	5.01	8.5	9.5	11
Haryana	7.08	7.23	7.22	23	26.5	22.5
Rajasthan	6.29	7.6	8.08	27.5	29	32
Northern Zone	**16.05**	**17.31**	**20.31**	**59**	**65**	**65.5**
Gujarat	26.6	26.55	22.79	90	89	90
Maharashtra	42.18	44.91	42.86	76	87	84
Madhya Pradesh	6.14	6.5	5.89	23	20	18
Central	**74.92**	**77.96**	**71.54**	**189**	**196**	**192**
Telangana	18.39	21.27	24.51	42	54	51
Andhra Pradesh	6.2	6.57	6.06	15	18	17
Karnataka	7.18	8.17	7.65	16	20	22
Tamil Nadu	1.33	1.7	1.55	6	6	6
Southern Zone	**33.1**	**37.71**	**39.77**	**79**	**98**	**96**
Orissa	1.57	1.7	1.71	4	4	4.5
Others	0.5	0.09	0.08	2	2	2
Total	126.14	134.77	133.41	333	365	360

Source: Office of the Textiles Commissioner, GoI, (http://www.txcindia.gov.in/)

Cotton crop in India largely depends i.e. 65% on rainfall for irrigation. The crop of cotton is affected by pests and diseases. Cotton grows in the following 5 stages: Germination and emergence, Seeding establishment, Leaf area and canopy development, Flowering and ball development and Maturity.(National Cotton Council of America, n.d.)

Flood is one of the natural calamities that washes off the land and destroys the agriculture on that particular land. Multiple instances of flooding in India are reported in news. Floods have created havoc in India and large scale destruction of life and property has happened. Not only there has been displacement of the affected people but also the livelihood of them has been affected. The flooded land loses its fertility also and its not ripe for farming post the floods. Floods have washed away the fertility of the soil. In the past 65 years of India before 2017, the losses have been to the tune of Rs 3,78,247 crores and death of 1,07,535 people have occurred. A total of 8.07 crore houses have been

destroyed and 466 million hectare of land has been affected.(Mukesh Rawat, 2020). Recently floods in Punjab district destroyed cotton crop in 15,884 acres and possibility of estimation of loss was only possible after the water recedes.(Raakhi Jagga, 2020)

The present study has undertaken the listed companies in textile and cotton sector. India has declared floods as a natural calamity. But with regards to conducting research the year of 2013 has been selected as the flood year as declared by the Government. Price data of the selected stocks was taken into account one year prior to the flood and one year later of the flood year. Paired sample t test was used to arrive at the results.

Literature Review:

Jodie Thorpe & Shelly Fennell (2012) did a research with an objective to understand climate change risks and supply chain responsibility. The author wanted to understand the relationship between the climate change impacts and supply chain of agriculture commodities. The selected climate change calamities were floods, drought, storms and hurricanes. Large corporations utilizing agricultural inputs were selected. Starbucks for coffee, Mark and Spencer for cotton and the body shop with regards to sesame oil. The methodology utilised was interview technique with regards to qualitative research. It was concluded that support to small scale farmer by government as well as the multinational corporations is required so that they do not bear the effects of climate change in disproportionate way.

Hyperadapting (2016) did a research with an objective to understand the floods swoosh through Nike's supply chain. The author studied the natural calamities like rainfall, flood and drought with regards to Nike's operations. Nike has got operations in 42 countries. Due to the above natural calamities as a result of climate change, Nike had to shut down its factories. Increased frequency of floods made things difficult for Nike. Nike also changed its input mix of raw materials for certain products. The methodology adopted was descriptive. It was concluded that Nike should further broad based its production countries and holding additional inventory so that risk from natural calamities is mitigated.

Snake (2017) did a research with an objective to understand on the topic leading the path to fighting climate change of Nike. The author has studied the impact of climate change on the output from Nike. Understanding about typical supply chain of garment and footwear brand is highlighted. These points are then concentrated on the business model of Nike and the strategic factors it should care about. High temperatures affect cotton production, flooding (which had led to shut down of factories), water usage and higher shipping costs due to low-lying manufacturing areas. The methodology of research is descriptive in nature. The author concluded that the management of Nike has taken steps to reduce the effect of climate change by multiple ways like doing recycling, efficient

energy usage, decreased dependence on cotton and increasing dependence on recycled polyester, efficient water usage and using low impact fabrics.

Maxx Chatsko (2014) did a research with an objective to understand that will climate change end growth for Nike and Coca cola. The author has detailed about various climate change consequences like unpredictable weather, more frequent floods and increased droughts on the top lines and bottom lines of corporations like Nike and Coca cola. This will lead to reduction in the supply of water, cotton and labour. It states that the organisations will not become bankrupt but growth opportunities will take a hit. The methodology adopted is descriptive study. The study concluded that the climate change would give a strong motivation to the businesses and political leaders to enact tougher standards for energy efficiency.

Lynn Xie (2016)did a research with an objective to understand about the topic a poster child for climate change with regards to Nike. Climate change has affected Nike's footwear and apparel business. Nike operates 666 factories across 43 countries. Factories had to be shut down due to climate impact and there has been disruption in its supply chain due to flooding. The research was undertaken with descriptive methodology. As a result, Nike had taken lot of measures to make its business have less impact of climate. Nike relocated its factories to reduce the climate impact.

From the above review of empirical works, it is clear that different authors have approached their research on effect of flood in different ways in varying levels of analysis. These different approaches helped in the emergence of more and more literature on the subject over time. All the studies aimed to analyze impact of flood on different industries in India & abroad with several factors. The survey of the existing literature reveals that no specific work has been carried out to examine and ascertain the relationship between shareholders return of listed cotton companies with cotton production during the flood of 2013 in India.

Research Methodology:

Research Objective:

The research objective is to identify the relationship between shareholders return of listed cotton companies with cotton production. This would help to understand and provide guidance to the stakeholders of the cotton with regards to the price hedging and giving better profitability to the shareholders.

Sample Design:

The research study has used judgmental sampling as the method of sampling. The sample considered was a listed 67 companies in to cotton sector. Listed companies from both Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) was taken. No criteria for market capitalisation was kept so that all listed companies can form part of the sample. There were certain

companies which did not have any price history either in the before calamity year or after the calamity year and they were not taken as a part of sample. Yearly returns of stock prices was taken. The prices as on date 1st January, 2012 and on 31st December, 2012 was taken for before calamity year. The prices as on date 1st January, 2014 and on 31st December, 2014 was taken for after calamity year. Possible adjustments were done if the company was not traded on 1st January 2012 and was traded in later part of the year. The later part of the year with starting price was considered to include more companies in the sample. Companies which had been suspended or were under any sort of restriction from stock exchanges were not considered as there were no price data available.

Data Collection Method:

Listed Cotton Companies: The method followed for data collection would be secondary in nature. The data of listed companies into cotton and textile published on money control website has been taken.

Cotton Production: The method followed for data collection would be secondary in nature. The data of cotton production is published by Government and the same has been considered.

Time Period of Study:

The period of study with regards to this objective was one year before the calamity and one year after the calamity. The government declared the flood of the 2013 as national calamity and severe and hence the calamity selected was flood in the year 2013 and therefore returns prior to 2013 and after 2013 were taken into consideration. Share price returns were calculated for a year where prices were taken on 1st January, 2012 and 31st December, 2012 and return was calculated. The share price returns for after the calamity were taken by taking prices of 1st January, 2014 and 31st December, 2014. There had been companies which were not traded on 1st January, 2012 but were traded on later part of the year and therefore the prices have been taken at later part of the year to include them in the sample.

Hypothesis Framing and Design:

H_0 = There is no significant relation between cotton production and returns of listed cotton (Textile) companies before and after flood of 2013.

H1 = There is significant relation between cotton production and returns of listed cotton (Textile) companies before and after flood of 2013.

Tools of Data Analysis:

Student's t test dealing in before and after means was used as a method to analyse the above sample data. Out of the calamities under consideration, the data availability was checked for each one of them and then it was finalised to study the flood in the year 2013 as it was possible to assimilate data and come up with a workable solution.

T – test was developed by Mr. William Sealy Gosset in the year 1908 and he used to publish in the name called student and therefore the name of this test is Student T-test. He was working in a Guinness brewery in Dublin where he encountered smaller sample sizes. The existing techniques of data analysis required sample sizes to be large and were of no use to him and therefore he was keen to develop a data analysis technique for small sample sizes. Whenever the sample size is greater than 30 it approaches normal curve. T distribution is a family of curve and the curve is specified by degrees of freedom which is number of independent observations minus 1. (n.d.)

Result and Discussion:

Table 1 Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	BeforeFlood	60.4806	67	215.70758	26.35288
	AfterFlood	128.3585	67	328.22525	40.09910

Table 2 Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 BeforeFlood – AfterFlood	-67.87791	196.52766	24.00967	-115.81477	-19.94105	-2.827	66	.006

With regards to the Paired Samples Test the value of significance has to be seen. In this research the significance value is of 0.006.The significance value has been compared with 0.5, here the value is less than 0.5 and therefore alternative hypothesis is accepted. If the value is less than 0.5 then null hypothesis would have been rejected.

Findings:

With regards to the current research, it was found out that there is a relation between flood and listed companies. As the null hypothesis is rejected, it states that there is a relationship between the flood and the shareholder returns of the listed cotton companies.

Conclusion:

Following conclusions can be made out of the research conducted.

- Listed cotton companies are affected by flood and a mechanism is required with the help of which they are able to survive in a better way.
- There has to be a metric to understand the impact of flood on the cotton crop so that the listed corporates can adjust their purchases accordingly.
- The supply chain of the corporates can be better managed with the possibility of adequate inventories so there is no disruption in their productions.
- Shareholders of the cotton or textile companies can know well in advance the way in which they can manage their portfolios or shift or adjust or rebalance their portfolios for possibilities of flood.

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