

# Evaluation Of National And Industry-Specific Interventions On Coir Industry In India – A Special Reference To Kerala

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## ABSTRACT

*The purpose of the study is to delineate the impact of national and industry-specific government interventions and the influence of political parties in power. The study employs an interrupted time series design from the annual national coir export data (1970-2012) published by the Coir Board. The study concludes by highlighting that the significance of economic environment has a greater impact on the trends of coir exports than industry-specific interventions. A seminal finding of this study is that there is a significant difference in the coir exports during the period of governance by the two political fronts in Kerala.*

**Keywords:** Coir; India; Kerala; Government Policies; Programs

## INTRODUCTION

This paper examines the economic impact of government programs and policies in the coir industry in India. As Kerala is one of the largest exporters of coir, the study makes a special reference to Kerala. Kerala's abundant coconut trees and backwaters, suitable for the retting of coconut husks, have made the state the leading exporter of coir products in the world (Pillai, 1997; Coir Board, 2010; Kerala State Planning Board, 2013).

Kerala Comprises of 39,000 sq km of land (Heller, 1996) of which coconut is cultivated in 7,704.73 sq Km (Kerala Planning Board, 2013). This industry provides livelihood to around 375,000 people of which the majority are women (Kerala Planning Board, 2013). Having mentioned the significance of the coir industry in Kerala, it is inevitable to highlight the link between the coir industry and Kerala model. As repeatedly mentioned in academic articles (Heller, 1996; Singh, 2010), Kerala gained international recognition with its high life expectancy at birth, low infant mortality rate, decline in birth and death rates, sex ratio (women outnumber men) and literacy rate.<sup>1</sup> Kerala's social characteristics are distinctive from the rest of India (Heller 1996).

One other reason that distinguished Kerala was its low economic growth, in spite of the high human development index. However, Kerala's economy performed below the public expectations (Heller, 1996). Nevertheless, there have been changes in this trend. In 2013, Kerala's growth was higher than that of India (Enterprise and Economic Update Kerala, 2013). However, a similar growth has not been observed in the traditional industries. Traditional industries - like the coir - have failed to keep pace with national development because of inadequate machineries, operations, marketing, and infrastructure. Further, these challenges have taken a toll on the well-being of workers, as indicated by the suicide and suicide attempts among them, which has received wide media coverage (Indiavision, 2012; The Hindu, 2013). This scenario prompted the author to investigate the government's policies and programs that have been implemented to assist the growth of the coir industry. The remainder of this paper briefly delineates Kerala's political background and its coir industry, discusses the methodology, describes the main findings, and offers a conclusion.

<sup>1</sup> Kerala stands as unusual among the states in India because of its high sex ratio (1,084 women per 1,000 men in 2011), high literacy rate of 93.9 percent, and the lowest infant mortality rate at 13 deaths per 1,000 births against the national average of 47 deaths per 1,000 births (Government of Kerala, 2013).

## **Kerala and its Political Parties**

It is inevitable to discuss Kerala without referring to the Kerala model which received considerable attention from scholars all over the world (Singh, 2010). It is characterized by a high human development and low industrial development (Parayil, 2000; Parameswaran, 2007), and many researches have pointed out the effects of government policies that constructed the Kerala model. It is said to have recorded high social development due to the policies implemented by the political parties. Therefore, the following section will delineate the political environment of Kerala.

Kerala has been governed primarily by the Left Democratic Front (LDF), which consists of Communist parties and the right-leaning United Democratic Front (UDF) led by the Indian National Congress (INC). The left first came into power in India in the state of Kerala in 1957 (Oktem, 2012). Communist party started to gain power prior to 1957. Singh (1960) espoused that Kerala was the first to elect a communist party to office through fair and free election. Prior to 1957, the Communist party had to gain support from others; then in 1960, the party contested the election solo (Singh, 1960). Resulting in contradictory ideologies, the communist party was split into right and left, the right party was not as successful as the left (Ahmed, 1966). Long before the Congress party came into the picture, the prominent caste sects were active participants in the state's politics. The lower castes in Kerala "were not attracted by the Congress ideology, but by the prospect it held both for personal and group advancement as a party of power, patronage and prestige" (Ahmed, 1966, p. 395). Ahmed (1966) argues that Congress is not a dominant party as it is in other states. The political parties that have held power in Kerala have alternated between the Communist and Congress parties.

Ramachandran (1997, pp. 327-328) mentioned the role of political parties as crucial agents for creating changes in the state, such as mass literacy, agrarian relations, changes in the conditions of the oppressed castes, enlightened social attitude toward girls, and improved health care facilities. The land reforms introduced by the party reduced economic and social-political inequality, which shifted a large portion of the resources into the hands of the poor (Franke & Chasin, 2000; Singh, 2010). This improved the physical conditions of poor people and created an assertion of self-respect and dignity among the agricultural laborers and peasants in Kerala (Kurien, 2000, p. 179). Franke and Chasin (2000, p. 99) had referred to the vital lesson from Kerala that the poor must be organized to ensure that their needs are met. The poor should possess the resources to protect their interests against the wealthy. During the recession in the 1980's, poor people were protected against facing further financial problems (Franke & Chasin, 2000). The land distribution, effective food rationing, pensions, and the like, insulate the poorest groups from the economy during the recession (Franke & Chasin, 2000, p. 104). This was called the protectionist measures (Franke & Chasin, 2000). To elaborate, through 'protectionist measures', the government was compelled to support the rights of the workers.

Subsequently, militant peasant associations and labor unions arose (Subrahmanian, 1990). These groups agitate for and engage in the fight to meet their needs with whoever is holding formal power. The rise of militant trade unions has also led to strikes and lockouts in industries in Kerala. Subrahmanian (1990), Prakash (1994, p. 38), Thomas (2003), and Jeromi (2005, p. 3268) point to the fact that labor disputes had resulted in the slowdown of industrial growth. Political parties are able to declare a strike (bandh) in the whole state, for a district, for a town, or even for a specific market area (Prakash, 1994, p. 37; Jeromi, 2005). Thus there is an investment unfriendly political environment for emerging business.

The measures introduced by the government did not translate into economic growth (Ahluwalia, 2000; Joseph, 2010). Following the liberalization policy, Kerala's State Domestic Product (SDP) started to increase due to the devaluation of the Indian rupee, foreign demand for cheap labor, and thus, the rapid increase in agricultural and marine exports in Kerala (Joseph, 2010). The policy opened many global opportunities for India's various industries. In the case of the coir industry, the policy opened opportunities in Europe, which started to ban environmentally unfriendly products in favor of environmentally friendly ones like coir (Sabarinath, 2010).

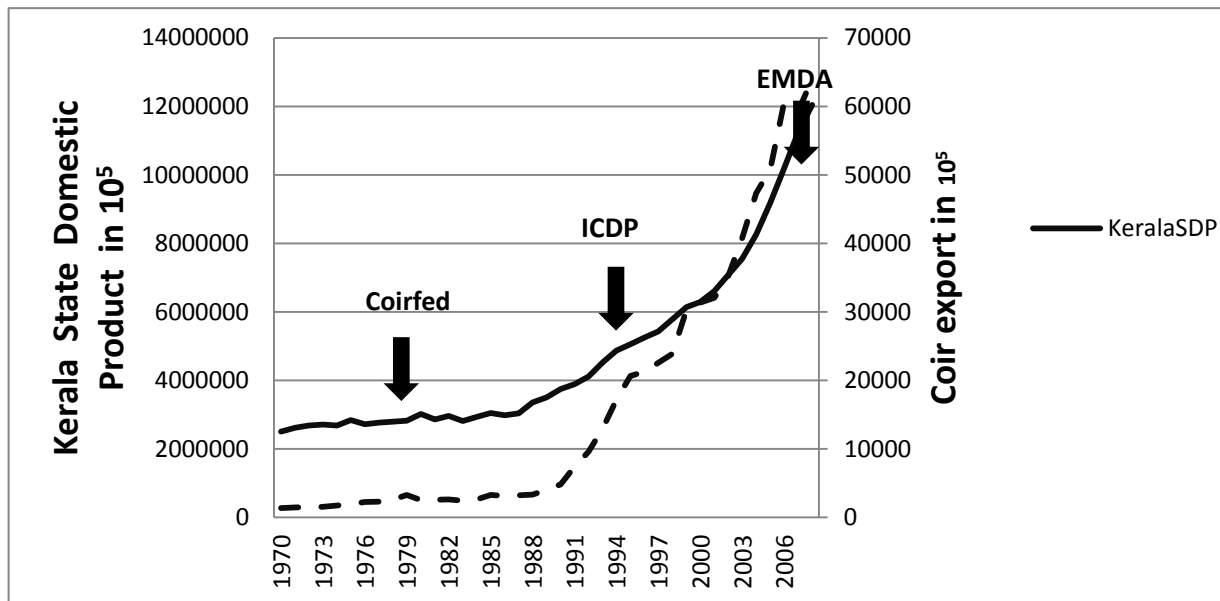
In 2005-06, SDP increased by 14.7% from the previous year, while in 2010, it indicated a 16% increase from the previous (Government of Kerala, 2013). Various authors (Jeffrey, 1978; Heller, 1996; Thomas, 2005) have argued that Kerala's high social development is unexpected in light of its low economic growth. However, in 2011-

12, Kerala’s growth rate - at 9.5% - exceeds that of India as a whole - 6.5% (Enterprise and Economic Update, 2013). Kerala’s economic situation gives an opportunity to measure the performance of the coir industry under the governance of different political parties. Data on exports were used to perform the analysis; exports are an indicator of industrial performance (European Commission, 2012, p. 3) which, in turn, is a major component of a country’s economic performance. Before delving into the analysis, the salient features of Kerala’s coir industry are outlined in the next section.

**Kerala and its Coir Industry**

Kerala supposedly takes its name from the coconut - Keram means coconut palm (Jeffrey, 1984). Coir, a type of fiber made from coconut husk, is used for manufacturing finished products, such as mats and carpets (Dictionary.com, 2014). Although the exact beginning of the industrial production of coir in Kerala is unknown, evidence shows that production grew significantly in the 16<sup>th</sup> and 19<sup>th</sup> centuries (Rammohan, 1999). The coir industry is the second largest employer in Kerala and is a significant source of income, especially for people in the low-income brackets (KITCO, 2009). Most coir workers (80%) are women and most of these women are tasked with spinning coir (KITCO, 2009).

As discussed in the previous section, the government implemented various protectionist measures to uphold the rights and interests of the poor, most of which were during the reign of the Communist party (Franke & Chasin, 2000). Eventually, these measures led to labor unions, which insulated the interests of poor workers by stalling modernization (Sabarinath, 2010). Since the 1950’s, the coir industry has been dealing with heavily fluctuating growth. Depression was recorded in 1950’s in Kerala; subsequently, in 1953, the government established the Coir Board to assist with the growth and development of Kerala’s coir industry (Sabarinath, 2010). The coir industry encountered husk shortage and labor union resistance to modernization. According to Kannan (1998), this resistance lasted into the mid-1980’s. The resultant slow growth of SDP until the 1980’s is illustrated in Figure 1.



**Figure 1: Trends in Value of Coir Export and Kerala’s State Domestic Product (SDP)**

Overall, the value of coir export and Kerala State Domestic Product have been improving over the years. The programs assisting coir production and export are indicated with an arrow, which is further explained in the following paragraphs.

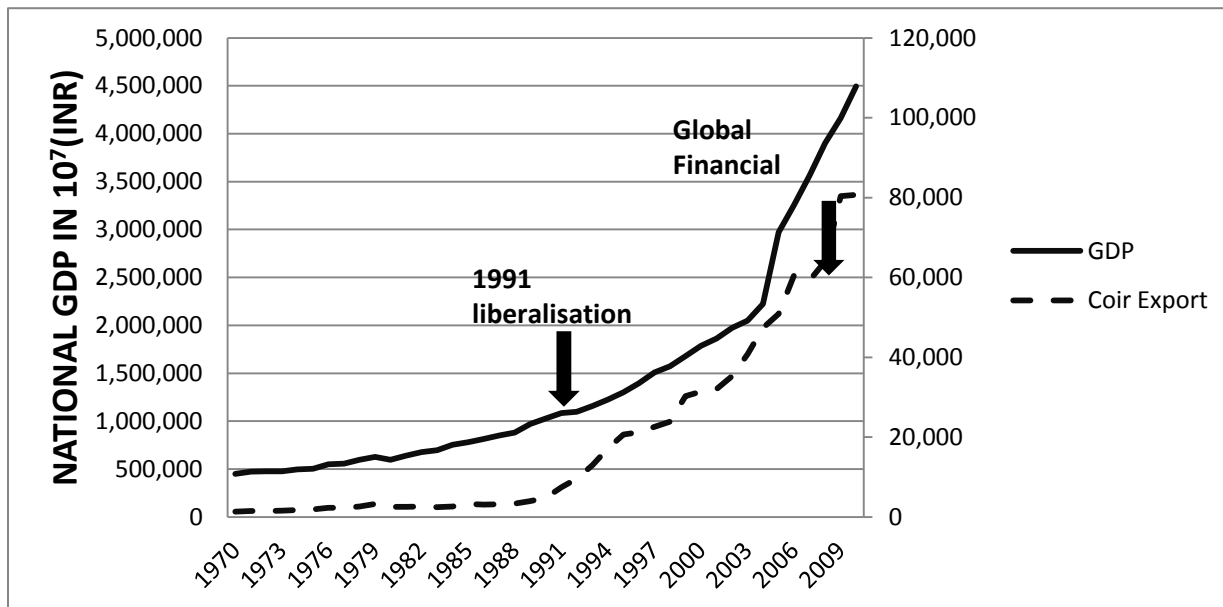
In 1979, the government introduced the Kerala State Coir Cooperative Marketing Federation (COIRFED) (KITCO, 2009), which is an apex federation of around 600 cooperatives (COIRFED, 2013). The COIRFED is a vital

component in promoting the economic well-being of the coir industry. Essentially, it facilitates the marketing of coir products to national and international markets (COIRFED, 2013).

The 1980’s were a turning point for Kerala’s economy and its coir industry. From 1980-1981 and 1990-1991, the annual growth of Kerala’s SDP (3.57%) was the lowest among the 14 states (Ahluwalia, 2000; Joseph, 2010); albeit the subsequent population decline prevented the SDP from plummeting further (Joseph, 2010). During this period, Kerala lost its monopoly in raw materials as other states in India (Tamil Nadu and Karnataka) started to produce coir (Sabarinath, 2010). This compounded to the deterioration of the coir industry, which prompted the government to implement measures to introduce modernization.

In spite of the protests to prevent mechanization of the coir industry, the declining production and the change in the industry environment compelled the introduction of mechanization to meet the increased international demand. The change in the industry environment was the result of 1991 liberalization policy (see Sundriyal, 1996; Datt & Sundharam, 1999, p. 218; Mathur, 2002; Vaidyanathan, 2003). The new policies reduced bureaucratic control on financial markets and new technologies were used to create electronic markets that helped to reach international benchmarks (Goyal, 2010; Goyal, 2012). Liberalization also broke down the monopoly of the state enterprises in order to reduce expenses. These state enterprises had to consider the profits and market valuations as important yardsticks of performance (Mayer, 2000). Hence, the 1990’s also saw the introduction of mechanization to meet the increased international demand (Sabarinath, 2010), which increased value and production.

Most of the growth occurred after 1992, a strong initial response to the liberalization policy (Goyal, 2012). However, merchandise exports plummeted after 1995 because of the emergence of petroleum products, which was not covered in the merchandise exports (Nayak, Aggarwal, & Mann, 2013). India recorded a decline in the export growth rate in 2008-2009, in Nayak, Aggarwal, and Mann’s (2013) paper. Merchandise exports grew continuously from 2002-2009. The negative growth in the year 2008-2009 was due to the global financial crisis and the slow recovery of world economy (Nayak, Aggarwal, & Mann, 2013). Figure 2 demonstrates more or less parallel variations with India’s GDP; i.e., there was an increase in Coir exports in the 1990’s and 2000’s when there was a spike in the GDP. A decrease is shown in coir exports during the global financial crisis.



**Figure 2: National GDP and Annual Coir Exports**

While in Kerala, the government introduced the Integrated Coir Development Project (ICDP) in 1993 to increase productivity and quality in the manufacture of coir products (Menon, 2013). This effort includes further modernization of machines to increase industrial productivity and, in turn, increase worker welfare. Menon’s (2013)

investigation of the status of the coir spinning division of the industry after the implementation of the project showed that workers' lifestyles, intake of solid food, and access to household appliances, like refrigerators, improved.

Subsequently, the government introduced the Export Market Development Assistance (EMDA) scheme in 2001 to assist coir exporters in the marketing and sales of their products (Centre for Development Management, 2008). When Centre for Development Management (2008) evaluated the scheme (EMDA), the program had a positive impact on the coir industry, specifically by increasing the quantity of exports. However, the study evaluated the coir industry only before and after the introduction of the scheme; hence, failing to take into consideration the exogenous factors that could have impacted the study outcome. Studies using time series analysis and considering the effect of exogenous factors, such as changes in the national economy and political parties, are required. Nevertheless, Kerala's economy, which previously did not prioritize social development, has been growing in recent years.

However, in the same year, the rate of coconut production declined (Kerala Planning Board, 2013) for several reasons: 1) cultivation areas for coconuts decreased by 8,145 hectares (Kerala Planning Board, 2013); 2) competition from neighboring states increased (Venugopal, 2004); 3) the costs of coir production increased due to the scarcity of coconut husks, but the price of finished goods did not (Venugopal, 2004); and 4) finally, the inadequate financial resources and export contracts took a toll on coir industry owners and workers, prompting some to commit suicide (Indiavision, 2012). These challenges made it difficult for workers to remain in the industry and, unsurprisingly, the number of workers declined from 400,000 in 2012 to only 80,000 in 2013 (The Hindu, 2013).

As the coir industry is a major agricultural industry in Kerala, the government initiated several programs, like the ICDP, specifically to improve the condition of workers and the output of factories. However, the worsening plight of the coir workers questions the efficacy of these programs. Thus, this study analyses the problems of the coir industry from a new perspective, using a multivariate analysis that combines various exogenous factors influencing the government interventions. In the subsequent sections, this paper reports the results of a time series analysis of India's exports of coir products in the last four decades and examines the relative importance of economic reforms and industry-specific interventions in improving exports.

## **METHODS**

This study performs a time series analysis of coir exports from India during the period 1970 to 2011, using export data of coir and coir products published by the Coir Board. The analysis includes the following variables: interventions specific to the coir industry and their capability of increasing productivity.

As national economic policies can influence industrial performance and GDP, the trend in GDP was compared with the coir exports. The data on GDP were drawn from economic census data published by the Government of India. Two methods - change-point analysis (CPA) and interrupted time series analysis with segmented regression - were used to evaluate the impact of specific interventions, real events, and changes in policy.

Change points are specific points in time series data when the values exhibit a change from the established pattern. In the ordered sequence of the data,  $y_{1970:2011} = (y_{1970}, \dots, y_{2011})$ , a change point occurs when there exists a time,  $T$ , between  $y_{1970}$  and  $y_{2011-1}$ , such that the statistical properties of  $(y_{1970}, \dots, y_t)$  and  $(y_{t+1}, \dots, y_{2011})$  differ in some way. The change points were identified using the Change-Point Analyzer version 2.3.

The segmented regression analysis of interrupted time series data (Wagner et al., 2002) was the statistical tool used to identify the impact of government interventions. Two parameters were identified by this tool - level and trend. The level is the value of the series at the beginning of an intervention and the trend is the rate of change (the slope) after the intervention (Wagner et al., 2002). A significant change in level constitutes an abrupt intervention effect. On the other hand, an increase or decrease in the slope of the segment after the event constitutes a change in trend. The following linear regression model was used (Wagner et al.'s 2002 paper is referred to explain the model). This model can be specified to estimate the level of and trend in coir exports (metric tons (MT)) per year before the intervention and following the intervention:

$$Y_t = \beta_0 + \beta_1 x_{time_t} + \beta_2 x_{intervention_t} + \beta_3 x_{time\_after\_intervention_t} + e_t$$

Here,  $Y_t$  is the quantity of coir exported (MT) in year  $t$ ; time is a continuous variable indicating time in years;  $\beta_0$  estimates the baseline coir exports at time zero;  $\beta_1$  estimates the change in the quantity of coir exported before the intervention (i.e., the baseline trend);  $\beta_2$  estimates the change in the level of the quantity of coir exported after the intervention - that is, from the end of the preceding segment; and  $\beta_3$  estimates the change in the trend in the quantity of coir exported per year after the intervention. The error term  $e_t$  at time  $t$  represents the random variability not explained by the model.

One of the issues in regression analysis of time series data is autocorrelation. This refers to the dependence of the observations on its own past or future values. In a statistical analysis, presence of autocorrelation may lead to underestimation of standard errors and overestimation of significance of the effects of an intervention (Wagner et al., 2002). Durbin-Watson statistic (DWs) was used in this study to detect autocorrelation. DWs values range from 0 to 4. The DWs values, which are closer to 2.0, indicate no serious autocorrelation. In the absence of autocorrelation, the values tend to move away from 2. In the presence of positive autocorrelation, they tend to move toward zero, and in the case of negative autocorrelation, they tend to move towards 4.

**RESULTS**

**Trends in Coir Exports**

The time trends in the exports of coir and coir products from the period 1970 to 2011 are depicted in Figure 3. The values and quantities of the coir exports are indicated in the dotted and straight lines, respectively.

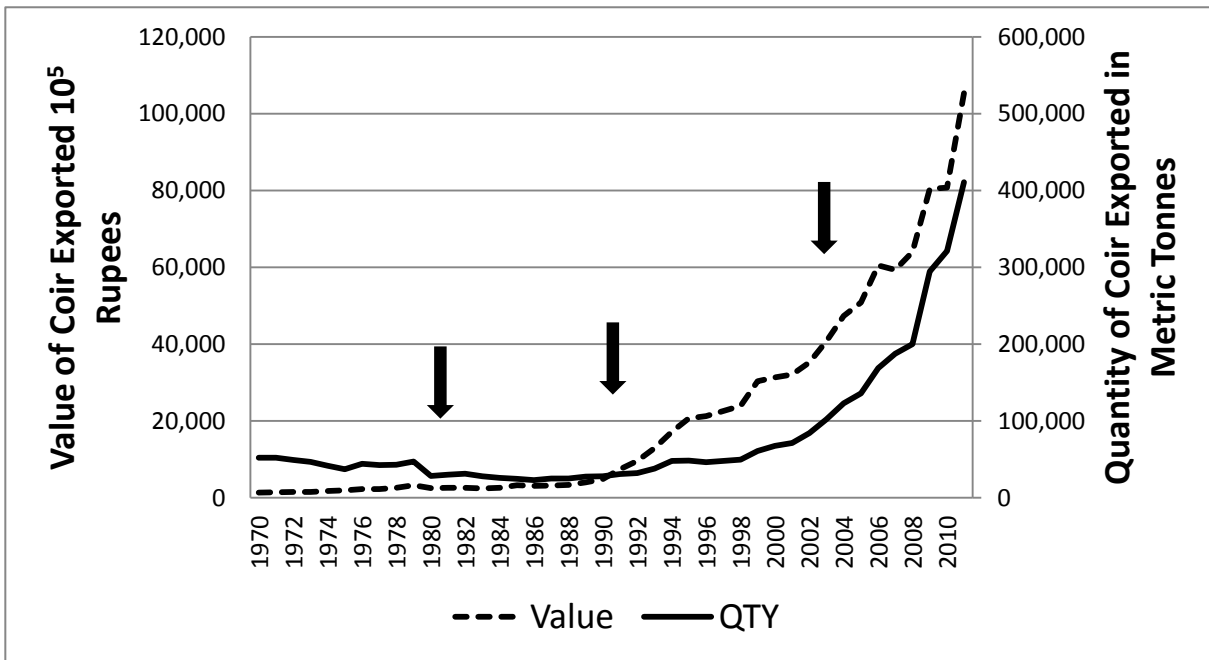


Figure 3: Export Trends in Coir and Coir Products from 1970 To 2011

The time trend in coir exports, like the Kerala economy, can be classified into three distinct phases - stagnation, recovery, and accelerated growth, which are indicated in the figure by three arrows.

*Period of Stagnation*

The period from the early 1970's to mid-1980's has been called a period of stagnation in the Kerala economy. The slow growth rate was depicted in almost all aspects of the Kerala economy, including the coir

industry. The first two decades (1970 to 1979 and 1980 to 1989) showed a negative trend in the quantity of coir exported (-949 MT/year,  $p = 0.069$ ; and -581 MT/year,  $p = 0.038$ ) and a positive trend in the value of coir exported (+18.9 million rupees per year,  $p < 0.001$ ; and +14.8 million rupees per year,  $p = 0.001$ ). A plausible explanation for this paradox is the increase in the proportion of value-added products among coir exports; that is, using coir to develop products like roll up mattress, mats, etc. In the second decade (1980 to 1989), the value of coir exported showed a negative trend in terms of dollars (-\$0.64 million,  $p = 0.022$ ) despite a positive trend in exports in terms of rupees. The continuing depreciation of the rupee, in relation to the dollar, accounted for this phenomenon in the period 1980 to 1989. The SDP started increasing only after the liberalization. From 1990 to 2011, there were positive trends in the quantity ( $p < 0.001$ ) and value ( $p < 0.001$ ) of coir exported. In the next subsections, the periods of recovery and accelerated growth are discussed, along with the change-point analysis (CPA).

### Change-Point Analysis (CPA)

In the CPA, three change points were identified in the time trends; namely, 1980, 1991, and 2003. A change point is considered an important event if the trend following the change point shows a significant ( $p < 0.05$ ) variation. The results of the segmented regression analysis of the change points are shown in Table 1. The regression analysis for this model shows that the export at time zero was `968 lakhs (US \$1,558,776.21). The general trend in exports increased at the rate of 189 lakhs per year (US \$304,347.83), albeit not significantly ( $p = 0.410$ ). The change point 1980 was not followed by a reduction in exports at the rate of 41.81 lakhs per year (US \$67,326.89), albeit this reduction was not statistically significant ( $p = 0.897$ ). The change points 1991 ( $p < 0.001$ ) and 2003 ( $p < 0.001$ ), however, were identified as significant events as they were followed by statistically significant increases in exports at the rates of 2,507 lakhs (US \$ 4,037,037.14) and 2,587 lakhs (US \$ 4,165,861.62) per year, respectively. These change points coincide with important milestones in the Indian economy, which will be discussed in the following subsection. The Durbin-Watson statistic was 1.993, indicating the absence of any autocorrelation in the regression model.

**Table 1: Results of Segmented Regression with Model-1**  
**Dependent Variable is Value of Coir Exports; Independent Variables**  
**Include General Trend and Trend Following Change Points**

Variables	Beta	Std. error	t	Sig.
Constant	967.92	1,406.09	0.688	0.496
General Trend	189.01	226.61	0.834	0.410
Change Point 1980	-41.82	320.48	-0.130	0.897
Change Point 1991 ( <i>Liberalization</i> )	2,507.31	320.48	7.824	0.000
Change Point 2003	2,586.55	299.78	8.628	0.000

### Relevance of Change Points

#### Liberalization

A change point in the data on the value of coir exported was the year 1991. However, this change point was not specific to the coir sector. In the CPA, a change point was also detected at year 1991 in the time series data on national GDP, income from the primary and secondary sectors in Kerala, and in the SDP. The results of the segmented regression analysis show a significantly increasing trend in coir exports after 1991 when the liberalization policy was introduced. The subsequent acceleration in the national economic growth was also reflected in the coir exports, which started rising sharply in the 1990's at the rate of 2,507 lakhs (US \$4,037,037.14) per year.

#### Period of Accelerated Growth

A third change point (2003) was observed in the data on coir exports, national GDP, Kerala SDP (2005), and income from the primary and secondary sectors in both Kerala and India (2005). The nation witnessed a remarkable growth after 2003/2004. Bhalla (2008) provides several possible explanations for this phenomenon: 1) declining real interest rates, 2) delayed effect of liberalization after a long lag period, and 3) the global phenomenon of 'a rising tide lifting all boats' (Ibid); i.e., when India's economy improved, this national economic growth also assisted the growth of other sectors. The factors analyzed in this study, are not specific to the coir industry. The third

change point also shows a significantly increasing trend in coir exports, which rose by 152 crores of rupees (US \$24,476,651.17) per year.

### Impact of Industry-Specific Interventions

Interventions specific to the coir industry that could have increased production and exports were included in the segmented regression analysis. These interventions were the establishment of coir cooperative societies and COIRFED and the implementation of the ICDP and EMDA.

As mentioned, the government introduced the COIRFED in 1979. In the segmented regression analysis, COIRFED was introduced as a variable at 1979. Regression Model-2 was completed by adding the other two interventions (ICDP and EMDP) as independent variables as well. The regression results are shown in Table 2. The general trend in exports and trend after liberalization were also included in the model. The Durbin-Watson statistic of 1.9691 ( $p > 0.05$ ) indicates the absence of any autocorrelation in the regression model. ICDP ( $\beta = 34, p = 0.847$ ) and COIRFED ( $\beta = 5.75, p = 0.701$ ) did not have any significant impact on the trend in coir exports. EMDA showed a significant positive trend, indicating a rise of coir exports at 325 lakhs (US \$522,054.81) ( $\beta = 325, p = 0.000$ ) per year after the introduction of the program. However, this intervention occurred at the same period as the change point 2003 identified by the CPA, during which the Indian economy exhibited a miraculous growth (Bhalla, 2009).

**Table 2: Results of Segmented Regression with Model-2**  
Dependent Variable is Value of Coir Exports; Independent Variables  
Include General Trend and Industry-Specific Interventions

Variables	Beta	Std. error	t	Sig.
Trend after COIRFED	5.75	29.51	-0.195	0.847
Trend after Liberalization	255	84	3.035	0.005
Trend after ICDP	-34	89	-0.388	0.701
Trend after EMDA	325	41	8.069	0.000

### Political Parties in Power in Kerala and Their Impact on Coir Exports

The regression model testing the null hypothesis that the ruling political parties did not affect coir exports included the political parties in power (LDF and UDF) as a dichotomous independent variable. The model also included the general trend, as well as the trends after liberalization and after 2003. The results in Table 3 show that the coir exports were significantly high during one regime (LDF regime) ( $p = 0.0351$ ). The hypothesis of no difference was rejected as the data showed a significant difference in coir exports between the two government periods.

**Table 3: Results of Segmented Regression with Model-3**  
Dependent Variable is Value of Coir Exports; Independent Variables Include  
General, Post-Liberalization, Post-2003 Trends, and Governments in Kerala

Variables	B	Std. Error	t	Sig.
Trend after Liberalization	1,876.69	217.06	8.6458	0.000
Trend after 2003	2,555.01	273.79	9.3321	0.000
Governments	1,763.00	805.27	2.1893	0.035

These findings prompted the author to perform a subgroup analysis in which different subgroups based on the change points were analyzed. The post-liberalization coir exports differed significantly during the governance by the two political parties. The results of the regression analysis are provided in Table 4. The Durbin-Watson statistic was 1.762, which indicates the null hypothesis of zero autocorrelation in the model can be accepted.



**Table 4: Results of Segmented Regression of Model-4**  
**Dependent Variable is Coir Exports: Independent Variables Include General Trend,**  
**Trend after 2003, and Governments in Kerala (LDF and UDF) Period After 1991**

Variables	B	Std. Error	t	Sig.
General Trend	1,735.49	346.99	5.002	0.000
Trend after 2003	2,941.44	505.53	5.819	0.000
Governments (LDF Vs UDF)	3,700.47	1568.87	2.359	0.031

The results of the above analysis suggest that coir exports increased during the LDF's rule. However, it is essential to acknowledge the contribution of the shared commitment between the ruling and opposition parties.

## SUMMARY

This paper makes a significant contribution to the researches on the coir industry in Kerala by performing the time series analysis. One of the advantages of this study is that it endeavors to overcome the shortcomings of the past studies by not only analyzing the impact of the schemes on coir exports, but also analyzing macro policy changes on coir exports. To facilitate the impact of micro and macro government interventions, time series analysis was used. As per Ramsay et al. (2003), most studies using time series analysis failed to adjust pre-intervention trends and the effect of autocorrelation. These criticisms are overcome in the present paper by taking into consideration the changes before and after the period of implementation of policies. To exemplify, a major contribution of the study is that it showed that the effect of economic environment on coir export is more perceptible than industry-specific interventions. Using change-point analysis, the study identifies two major change points in the time trends of coir exports; that is, in 1991 when liberalization policy was introduced, and 2003 when the Indian economy was perceived to have underwent 'miraculous growth'. These two change points are important milestones in the economic growth of the nation after which the quantity and value of coir exported increased significantly. An analysis that does not take into consideration such major events may arrive at misleading conclusions.

The study also evaluated the impact of governmental programs focusing on coir production and sales but did not find any significant positive impact of these programs on coir exports. Exports increased after the implementation of the EMDA, but the scheme was introduced during a period of phenomenal economic growth. Thus, the positive impact could very well be the result of the economic changes that took place after 2003.

Another important contribution of this study is finding a significant difference in the coir exports during the governance by the two political parties in Kerala. However, it is not possible to conclude from the analysis alone that the increase in output during one period was due to the pro-business growth strategy of one political party (LDF). For example, industrial performance and exports could decline because of strikes. This study did not consider the days lost as it was not within the scope of the study. Nonetheless, the difference in exports found during the governance by the two political parties is statistically significant and thus highlights the importance of studying the impact of political parties and warrants further in-depth research. In addition to growth in the coir export industry, it is important to analyze the impact on the environment, as the production of coir can contaminate Kerala's backwaters<sup>2</sup> and chemicals used in the industry may have an adverse effect on the workers' health.

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<sup>2</sup> <http://www.emergingkerala2012.org/pdf/project-under-msme/modern-coir-retting-unit.pdf>

this, Roshni worked for an organization that undertakes projects in restructuring of public sector units in Kerala, India. This motivated her to research the problems with government policies. Some of her research focuses on the role of the Indian caste system, gender issues, and its relation to business performance. E-mail: [roshni@uow.edu.au](mailto:roshni@uow.edu.au)

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