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ABSTRACT

Plantation is one of the key sectors which have an impact on the economic growth of our country. Plantation crops include: Tea, Coffee, Rubber, Pepper and other spices; Tobacco is also classified under this category. "Plantation" means any land used or intended to be used for growing tea, coffee, rubber or cinchona which admeasures twenty- five acres or more and whereon thirty or more persons are employed, or were employed on any day of the preceding twelve months, and in any State where the provisions of this Act have been applied by notification under sub-section (4) of section 1 to any other class of plantations, means also any land used or intended to be used for growing the plant mentioned in such notification and whereon thirty or more persons are employed, or were employed on any day of the preceding twelve months(PLA 1951). Rubber is a Brazil native crop introduced in India by the British. In India rubber plantations are spread over 5.97 lakh hectares cultivated in 16 states. It has been traditionally confined to Kerala and Kanyakumari District of Tamil Nadu of which 90% of the total output is from Kerala, next comes Kanyakumari District, followed by Tirpura with 4%. Kanyakumari District accounts for 98% of rubber production in Tamil Nadu. It employs thousands of labours mostly from the rural area where there is very little employment opportunity. Issues such as comparatively lower wage and inconvenient working conditions have made this sector unattractive, hence the workers are shifting to other sectors owing to better wages and working conditions. Due to this there is inadequate skilled labour.

Keywords - Labourer, Labour shortage, Plantation, Plantation crop, Rubber.

I. INTRODUCTION

1.1 Introduction

One of the important plantation crops of India is Rubber. Rubber is an elastic substance made from sticky, milky white liquid called latex extracted from the bark of the rubber tree (Hevea Brasiliensis) through a process called tapping. Rubber is a Brazil native crop introduced in India by the British; however cultivation in commercial scale were initiated as early as 1873. It plays a vital role in the National Economy. In the early years rubber was grown only in Kerala and Kanyakumari District in Tamil Nadu, which are the traditional rubber growing areas of the country. But currently, Rubber is also grown in Tripura, Assam, Meghalaya, Mizoram, Manipur, Goa, Coastal Karnataka, Orissa, Andhra Pradesh, Madhya Pradesh and West Bengal. India is the sixth largest producer and consumer of natural rubber in

the world, an annual production of 774,000 tonnes. In the Indian production, Kerala contributes more than 90%, Tamil Nadu 4% followed by Tripura, and other rubber producing states.

In Tamil Nadu, Kanyakumari District accounts for 98 percentage of rubber production. It has suitable soil and climate for the cultivation of rubber trees. Out of 91807 hectares of total crop area, rubber is cultivated in 19500 hectares. There are 126 small scale rubber-based industries registered under the District Industries Centre (DIC). They provide employment to 1874 people^[1]. Rubber is being cultivated in three taluks of the District: Kalkulam Taluk - 180 rubber estates, Thovalai Taluk - 13 rubber estates, Vilavancode Taluk - 230 rubber estates according to Rubber Board, Marthandam. According to department of Economics and Statistics of Kanyakumari District there are 41 registered rubber estates with 7373.126 hectares of land in which there are 1998 male labourers and 988 female labourers. Land coverage under rubber plantation in Kanyakumari District is 27407 hectares, which is more compared to food grains- 1242 hectares, oil seeds- 24232 hectares, and fruits and vegetables 957- hectares of land^[2]. The district produced 85117200 Kg (approx) and an average yield of 4200 Kg/ha of rubber during the year 2013-2014^[3]. Due to variety of reasons the conditions in the plantations remained unsatisfactory for a long time.

1.2 Problem of the Study

Plantations are considered to be the major labour absorbing industry in the country. In the cultivation and production of rubber, Kanyakumari District of Tamil Nadu holds a dominant position. It employs millions of labourers mostly from the rural area where there is very little employment opportunity. Due to various pull - push factors the younger generations are moving towards urban areas for better employment opportunity. More than 50000 people depend on this industry for their existence as growers, processors, dealers and workers along with their families^[4]. Here labourer means workers, according to PLA act 1951 worker means a person employed in a plantation for hire or reward, whether directly or through any agency, to do any work, skilled, unskilled, manual or clerical. As far as Kanyakumari District is concerned more than 90% of the population is literate and they opt for better paid job as the wages in rubber plantations are low. This sector is currently facing lot of changes and challenges, related to living condition of labourers, socio-economic condition of labourers, change in trade regulations, climatic change and changes in customer expectation are some of them and has significant impact on labour market, labour productivity, health condition, and living condition of labourers. The above mentioned changes have resulted in labour shortage, which has become a serious problem for the planters and also poses serious threat to the sector. Labour shortage means lack of labourers against required number of labourers for a particular job. This condition of crisis in the plantation sector has adversely affected the performance and economic sustainability of the plantation sector and the livelihood of the labourers. Issues such as comparatively lower wage and inconvenient working conditions in plantations have made the sector unattractive to labourers. Due to this plantation workers are shifting to other sectors owing to better wages and working conditions resulting in inadequate skilled labours.

1.3 Objectives

To identify the reasons for labour shortage in rubber plantations.

1.4 Review of literature

Sharma Gaurav, Joseph Joby, George Tharian and Dey (2011)^[5] in their article "Impact of Mahatma Gandhi National Rural Employment Guarantee Act on Rubber Block Plantation Scheme in Tripura" has published that, since the introduction of MGNREGA, there has been a wide difference between the wage rates of general agricultural labourers under the statutory minimum wages in the state and wage of the

family labour under the BPS. The observed difference between the two wage rates were maximum (52.29%) during the year 2007. During the pre-MNREGA phase, there was excess of family labour availability to the extent of 125.32 per cent and in the first year of planting it was as high as 196.23 per cent. Conversely, in the post-MNREGA phase, the estimated shortage of family labour was more than 9 per cent and in the first year, it was more than 41 per cent. Due to persistent divergence between the two wage rates there has been a steady outflow of potential family labour under the BPS scheme to the schemes under the MGNREGA.

Dato, Y.B, (1983)^[6] in his paper presented in the conference "Proceedings of Planters" held in RRIM and stressed the need for mechanization of rubber plantation to cope up with the growing labour shortage. He recommended developing a tool which should be as light as a tapping knife and should be able to tap a tree in less than two seconds the time required for the conventional manual tapping.

Sajeena, $(2010)^{[7]}$ in her thesis "Production and Marketing of Rubber in Kanyakumari District", has revealed that important factors which influenced the dynamic growth were captive domestic market and relatively remunerative price enjoyed by the crop during the study period. The study revealed that the major factors affecting the viability of rubber producers were in a steady increase in cost of the production, the instability of price and the shortage of skilled labour.

Deepa, Mishra Ranjan Bibhuti, Mathews Anu, Shankaranan, Suresh, $(2015)^{[8]}$ in their paper "Research and Development", has presented that one of the major problems faced by the plantations is the inadequate supply of skilled tappers. When labour shortage started to affect the productivity, timely intervention in the form of propagation of LFT was adopted. In this method, rubber trees are tapped in a lesser frequency rather than following daily tapping. This would also help in addressing the tapping panel dryness of the rubber plantation. Another response to the challenge of labour shortage was the attempt to mechanise tapping by development of tapping machines.

Bashir Irfan, Sheshgiri, & Rajesh, (2015)^[9] in their study on "Extension and Training Sub System", has presented that one of the serious problems faced by the rubber growers is the shortage of tappers. Construction boom and the high salary offer for jobs in other sectors severely affected the tapping sector. To tackle this issue, Rubber Board has promoted the setting up of labour banks through RPS. Workers registered in the labour banks will be given free training in all the aspects of operations in rubber plantations. Though this is a good initiative to overcome the problem of labour shortage, tapper's labour bank is not functioning in an effective manner. It is widely observed that the younger generation is showing less interest in tapping and other labour activities. To overcome the entry barriers of the youth towards taking up plantation labour the Rubber Board has come up with various welfare programmes and services to improve their living conditions.

Sha Sohan, Kumar Prasanna, Jacob Farida Jannet, Thapa Namrata, (2015)^[10] in their paper "Organisational Innovation in Natural Rubber: The Case of Rubber Producers Societies", has shown that structural devolution has had several implications in the labour market in the plantations. (Viswanathan, Tharian and Joseph, 2003; Nair, 1997).One major implication has been in terms of labour shortage in plantations which can be expected to have arisen in the context of a growing economy with highly vibrant industrial and service sectors which create new employment opportunities with higher wages (Joseph and George, 2010).Studies have pointed out that the change in the job expectations of the youth in Kerala, with better social development indicators. Thus, labour shortage is indeed an indicator of the subtle socio-economic and cultural changes; and low economic and social status that makes the younger generation to look for work in other sectors especially blue collar or service sector jobs. The higher education levels achieved by them seem to have further strengthened their trend (Francis, 1990).

1.5 Need for the Study

Rubber has been regarded as one of the sources of foreign exchange. Rubber plantation has being upheld as a key sector in India's inclusive growth strategy. Thousands of people in Kanyakumari District depend on plantations for their livelihood. It is perceived that issues such as, low wage and poor working conditions in plantations have made the sector less attractive to labourers to remain. The reasons for such labour issues are not clearly understood. Further, studies related to plantation labourers are also outdated ones; belonging to 1960's and 1980's and no recent studies are being carried out, hence there is a dearth of literature. Several changes have taken place in the working environment, in production practices, in the living conditions, amendment in the act, socio-economic factors etc in the recent years. These changes demand lot of attention for the sustenance of the rubber plantation. The studies already carried out are mostly relevant to tea and other plantation crops but not pertaining to rubber. However, most of the empirical work of rubber plantation is related to production, productivity, marketing and trade aspects of plantations. Therefore a detailed study is necessary in this area. Hence there is a need for a new study to be carried out and also it would serve as a base for further study related to labourers and rubber plantation as a whole.

II. METHODOLOGY

2.1 Type of research

This research is descriptive and analytical in nature.

2.2 Population

The population considered for the purpose of this study is labourers of registered rubber plantations of Kanyakumari District. Labourers include tappers, field workers and supervisors.

2.3 Sampling Method

The researcher has chosen 326 sample labourers at random by using lottery method. Stratified random sampling method has been used for selecting the respondents.

2.4 Method of Data Collection

The present study is carried out based on the information collected from the primary sources, as much information is not available from secondary sources. The primary data were collected using structured questionnaire as a tool for data collection.

III. ANALYSIS AND INTERPRETATION

3.1 Identification of the reasons for Labour Shortage in Rubber Plantation through Factor Analysis

Factor analysis is a technique used to reduce a large number of variables into fewer numbers of factors. This technique extracts maximum common variance from all variables and puts them into a common score. Many independent and dependent variables influence the reasons for labour shortage in rubber plantation. The relationship between the variables and the identified reasons for labour shortage are analysed through factor analysis. In the present study, there are 25 identified variables, which are the reasons for labour shortage. The variables are:

1. Insufficient annual household income 2. Level of education 3. Type of Employment 4. Lesser number of working days 5. Wages are high in other sectors 6. Need a part time job to supplement the expenses 7. There is ESI facility in the plantation 8. Management provides PF benefit to the labourers in plantations 9. Management provides bonus to the labourers in plantations 10. Children get better education opportunity in plantation 11. Plantation workers are more prone to consume alcohol 12. Workers lack proper skill in tapping 13. In other sector one gets job everyday 14. Working with MGNREGA scheme is preferable 15. Working with plantation is my passion 16. Working in plantations is not lower to my status 17. My children perceive other sector job as a prestigious one 18. There is little recognition in the society for the plantation workers 19. There is man animal conflict in plantations 20. Unfavourable employment conditions compared to other sectors 21. There is no job security in plantations 22. There is good relationship between supervisors and staff 23. Lack of interpersonal skill 24. Working in plantations causes health hazards 25. Plantation occupation not difficult as other occupations.

3.2 The Analytical Framework

The technique factor analysis is adopted to identify and analyse variables, which influence the reasons for labour shortage. Factor analysis is a multivariable statistical technique that explains the inter-relationship among the total set of observed variables. It is a way of grouping the variables, based on the criteria of common characteristics, which would serve as a common denominator for such a classification. The primary purpose of factor analysis is the resolution of a set of observed variables in terms of new categories called factors. In the present study factor analysis is employed to reduce a set of 25 variables to a smaller set of more meaningful and more nearly unconnected factor.

In order to study whether all the 25 variables are the reasons for labour shortage, factor analysis is employed. In factor analysis each variable is assigned factor loadings. The correlation coefficient between a variable and the underlying factor is called factor loading.

There are several methods available for factor analysis. But the principle factor method with orthogonal varimax rotation is mostly used and widely used in the statistical package for social sciences (SPSS). One of the final outcomes of factor analysis is called rotational factor matrix is a table of co-efficient that expresses the ratio between the variable and the factors which have been grouped. The sum of squares of the factor loadings of variables is called communality of a factor is called its variance. The factors with factor loadings are of 0.50 are greater and considered as significant factors. This limit is chosen because it had been judged that factors with less than 50% variation with rotated factor pattern are too weak to report.

In the present study, the principal factor analysis method with orthogonal varimax rotation is used to identify the factors influencing the reasons for labour shortage in rubber plantation. Justification for using orthogonal varimax rotation is that it maximizes the amount of variance explained by a minimum number of orthogonal (uncorrelated) variables.

The first output from the analysis is a table of descriptive statistics for all the variables under investigation. Typically, the mean, standard deviation and number of respondents (N) who participated in the survey are given in table 1.

TABLE 1

Descriptive Statistics

SI. No.	Variables	Mean	S.D	Analysis (N)		
1	Insufficient annual household income	1.6	0.623	326		
2	Level of education	2.73	0.954	326		
3	Type of Employment	1.71	0.725	326		
4	Lesser number of working days	3.06	0.848	326		
5	Wages are high in other sectors	4.57	0.652	326		
6	Need a part time job to supplement the expenses	4.6	4.6 0.597			
7	There is ESI facility in the plantation	4.03	0.75	326		
8	Management provides PF benefit to the labourers in plantations	4.64	0.913	326		
9	Management provides bonus to the labourers in plantations	0.969	326			
10	Children get better education opportunity in plantation	4.45	0.996	326		
11	Plantation workers more prone to consume alcohol	3.69	1.079	326		
12	Workers lack proper skill in tapping	3.8	1.026	326		
13	In other sector one gets job everyday	4.02	0.894	326		
14	Working with MGNREGA scheme is preferable	GNREGA scheme is preferable3.92		326		
15	Working with plantation is my passion	3.99	1.125	326		
16	Working in plantations is not lower to my status	3.21	1.501	326		
17	My children perceive other sector job as a prestigious one	3.39	1.517	326		
18	There is little recognition in the society for the plantation workers	3.59	1.271	326		
19	There is man animal conflict in plantations	4.3	1.241	326		
20	Unfavourable employment conditions compared to other sectors	3.52	1.367	326		
21	There is no job security in plantations	3.82	1.553	326		
22	There is good relationship between supervisors and staff	3.01	1.484	326		
23	Lack of Adequate Skill	3.31	1.298	326		
24	Working in plantations causes health hazards	3.36	1.307	326		
25	Plantation occupation not difficult as other occupations	2.82	1.473	328		

Looking at table 1 one can conclude that the variable 'Management provides PF benefit to the labourers in plantations' is the most important variable that influences labour shortage. It has the highest mean of 4.64 and the variable 'Insufficient annual household income' has the least mean of 1.6.

Table 2

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		
Bartlett's Test of Sphericity	Approx. Chi-	7400.
Square		841
	Df	300
	Sig.	.000

The Kaiser –Meyer-Olkin (KMO) measures the sampling adequacy whether the variables are adequate to correlate. The KMO value should be close to 0.5 for a satisfactory factor analysis to proceed. Looking at table 2, the KMO measure is 0.555, which is above 0.5 and therefore can be accepted. Bartlett's test is another indication of the strength of the relationship among variables. From table 2 we can see that the Bartlett's Test of Sphericity is significant at 0.000 which is less than 0.05 and indicates that it makes sense to continue with the factor analysis. This shows that there is relationship between the variables.

Table 3

Total Variance Explained

Component	Initial Eigenvalues			Extra	ction Sums Loading	of Squared gs	Rotation Sums of Squared Loadings			
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	6.174	24.696	24.696	6.174	24.696	24.696	4.896	19.586	19.586	
2	3.418	13.671	38.368	3.418	13.671	38.368	3.319	13.276	32.862	
3	2.885	11.538	49.906	2.885	11.538	49.906	2.878	11.512	44.374	
4	2.610	10.441	60.347	2.610	10.441	60.347	2.577	10.309	54.683	
5	1.731	6.926	67.273	1.731	6.926	67.273	2.380	9.522	64.205	
6	1.433	5.732	73.006	1.433	5.732	73.006	1.719	6.877	71.082	
7	1.126	4.504	77.509	1.126	4.504	77.509	1.607	6.427	77.509	
8	.913	3.651	81.160							
9	.780	3.121	84.281							
10	.731	2.922	87.203							
11	.618	2.470	89.674							
12	.476	1.903	91.577							
13	.398	1.591	93.168							
14	.315	1.261	94.429							
15	.271	1.084	95.512							
16	.245	.980	96.493							
17	.204	.818	97.311							
18	.153	.612	97.922							
19	.128	.511	98.434							
20	.120	.480	98.914							
21	.089	.357	99.270							
22	.069	.276	99.546							
23	.062	.248	99.795							
24	.030	.119	99.913							
25	.022	.087	100.000							

Extraction Method: Principal Component Analysis.

Eigenvalue actually reflects the number of extracted factors whose sum should be equal to number of items which are subjected to factor analysis. The next item shows all the factors extractable from the analysis along with their eigenvalues. The Table 3 shows that the First 7 factors were meaningful as they have Eigen values > 1. Factors 1, 2, 3, 4, 5, 6 and 7 explained by cumulative 24.696, 13.671, 11.538, 10.441, 6.926, 5.732 and 4.504% of the variance respectively – a cumulative total of 77.509%.

Table 4

Rotated Component Matrix								
	Component							
	1	2	3	4	5	6	7	
Lack of interpersonal skill	.133	.113	.191	180	746	.032	057	
Level of education	.183	.136	.679	092	.059	059	053	
Type of Employment	153	149	560	481	355	109	.041	
Lesser number of working days	010	.298	.114	.156	238	.622	155	
Wages are high in other sectors	241	.044	067	727	.021	.051	.186	
Need a part time job to supplement the expenses	.648	.162	.055	152	.049	.332	.288	
There is ESI facility in the plantation	.135	.074	.447	271	.725	250	.052	
Management provides PF benefit to the labourers in plantations	196	.896	004	.013	.009	047	.063	
Management provides bonus to the labourers in plantations	021	.948	.038	.017	.018	.044	.021	
Children get better education opportunity in plantation	.146	.903	.073	.049	007	.074	031	
Plantation workers more prone to consume alcohol	.374	093	149	.099	.180	.781	.162	
Workers lack proper skill in tapping	.397	.147	.333	046	.584	035	.357	
In other sector one gets job everyday	.655	.054	051	549	061	.058	273	
Working with MGNREGA scheme is preferable	.251	.063	.097	192	.736	.169	272	
Working with plantation is my passion	.219	066	096	014	009	.040	.889	
Working in plantations is not lower to my status	.779	.074	.185	.150	.381	011	.224	
My children perceive other sector job as a prestigious one	.623	027	.523	.053	.037	345	.226	
There is little recognition in the society for the plantation workers	.114	080	.646	.140	004	406	292	
There is man animal conflict in plantations	.346	.642	136	.173	.057	.209	350	
Unfavourable employment conditions compared to other sectors	.924	074	015	.015	.114	.130	.030	
There is no job security in plantations	.885	080	.102	.298	.006	.057	019	
There is good relationship between supervisors and staff	.655	.280	.167	.538	035	056	004	
Insufficient annual household income	037	.208	.112	.777	117	.260	.090	
Working in plantations causes health hazards	247	083	.777	.270	.042	.207	.044	
Plantation occupation not difficult as other occupations	.416	136	.536	.417	105	.157	.191	

Rotated Factor Matrix Scores for the Reasons of Labour Shortage in Rubber Plantations

The table 4 represents the matrix of common factor co-efficient or factor loadings. There are 25 variables related to the reasons for labour shortage and seven factors were extracted. The ratios, which have the highest loading (> 0.45) and the lowest (< 0.45) in each factor are grouped, that is, the ratios, which are closely related to a particular factor, are mentioned in bold letters. The rotated factor loadings received by F1, F2, F7 are assigned with suitable titles.

Factor – 1 (F1)

The first factor accounts for a variation of 19.586 per cent in the total variance. Seven variables are positively loaded in this factor. They are; need a part time job to supplement the expenses, in other sector one gets job every day, working in plantations is not lower to my status, my children perceive other sector job as a prestigious one, unfavourable employment conditions compared to other sectors, there is no job security in plantations, there is good relationship between supervisors and staff. As the above variables are related to the labourers discontent towards work, Factor -1 is characterized as 'Quality of work life'.

Factor – 2 (F2)

The second factor accounts for a variation of 13.276 in the total variance. Four variables are positively loaded in this factor. They are; management provides PF benefit to the labourers in plantations, management provides bonus to the labourers in plantations, children get better education opportunity in plantation, there is man animal conflict in plantations. As the above variables are related to **benefits** provided to labourers, Factor- 2 is characterized as '**Perks to the workers**'.

Factor – 3 (F3)

The third factor accounts for a variation of 11.512 in the total variance. Four variables are positively loaded in this factor. They are; level of education, type of employment, there is little recognition in the society for the plantation workers, plantation occupation not difficult as other occupations. The above variables are related to labourers scope for growth. Factor- 3 is characterized as **'Career growth'**.

Factor - 4 (F4)

The fourth factor accounts for a variation of 10.309 in the total variance. Two variables are positively loaded in this factor. They are; wages are high in other sectors, insufficient annual household income. The above variables are related to wages. Factor-4 is characterized as 'Income'.

Factor – 5 (F5)

The fifth factor accounts for a variation of 9.522 in the total variance. Three variables are positively loaded in this factor. They are; lack of interpersonal skill, there is ESI facility in the plantation, workers lack proper skill in tapping, working with MGNREGA scheme is preferable. The above variables are related to labourers skill towards plantation job. Factor-5 is characterized as 'Skill set'.

Factor – 6 (F6)

The sixth factor accounts for a variation of 6.877 in the total variance. Two variables are loaded positively in this factor. They are; lesser number of working days, plantation workers more prone to consume alcohol. The above variables are related to labourers working environment. Factor-6 is characterized as **'Working condition'**.

Factor – 7 (F7)

The seventh factor accounts for a variation of 6.427 in the total variance. Only one variable is loaded positively in this factor. That is working with plantation is my passion. As the above variable is related to labourers passion towards plantation job, Factor-7 is characterized as **'Working with plantation is my passion'**.

IV. FINDINGS & SUGGESTIONS

The study reveals that labour shortage is due to dissatisfaction with work life, benefits to labourers, low scope for development, low income, lack of skill, improper working condition and passion to work that

affects the workers some way or the other. Quality of work life can be improved by recognising the labourers work or rewarding them. Increasing the daily wage of the labourers would attract more labourers despite of their status. Hence the management can consider revising the wage comparative to other labour intensive sector or neighbouring states inorder to avoid migration of labourers to better paid jobs or neighbouring state. Increasing the wage beyond the minimum wages act can help to retain labourers. Skill shortage can be overcome by providing training to labourers. can increase tappers. Helping the labourers to start a secondary job such as farming or growing milch cow can improve the standard of living. Improving working environment by using bio fertilizers to avoid health hazards and improving social security measures provided to the labourers during off season can reduce labour shortage in plantation.

CONCLUSION

The study was conducted to find the reasons for labour shortage in Rubber Plantations of Kanyakumari District. Only organized rubber plantations were considered for the study. The study covers only Kanyakumari District and not applicable to any other region were rubber is grown. The researcher gathered information from the rubber plantation labourers through questions framed to understand the reasons for labour shortage. Wage is the main reason for labour shortage as labourers of other sector earn more than them, hence by increasing the daily wage of labourers can overcome the problem of labour shortage to some extent. The region surrounding still remains underdeveloped thus the labourers have no other source of employment to improve their lifestyle. The present wage structure is not adequate to run their family. Though they have drinking water, road, transportation and sanitation facility but not maintained properly. They are leading a life in poor condition and hence the younger generations are pursuing better paid jobs. Further studies may be conducted to explore the various other reasons for the plantation labour migrating to other jobs. Studies may also be conducted to find out the labour turnover, job satisfaction and social security needs among rubber plantation labourers.

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