A Study of Factors Affecting To the Sewing Employees Efficiency of Apparel Industry in Badulla District

PGS Dulari[1], SMBL Suraweera[2], KADTD Kuruppu[3], HBP Chathurangi[4]

[1,2,3](Department of Business Management, Rajararata University, Sri Lanka)
[4](Department of Accountancy and Finance,, Rajararata University, Sri Lanka)

ABSTRACT: *The main aim of this research study is to identify the factors affecting the productivity on apparel industry in the district of Badulla for sewing employees. The influences, human factors, organizational factors and technological factors are viewed as separate sewing-efficiency variables. The researcher developed eight hypotheses to address the research objectives. In this study literature help has been taken from various sources including research papers, journals, and sewing efficiency related books. The study population was all of the 875 sewing employees of three selected Badulla District garment factories. 100 Sewing workers are chosen as sample size for the study. In order to fulfill the study objective a survey was undertaken using a standardized questionnaire to collect primary data. To investigate the data, the researcher used the Correlation Analysis to determine the correlation between sewing efficiency and related sewing efficiency sources. Researcher then used Multiple Regression Analysis to classify factors as well as major causes affecting the apparel industry's sewing quality. The final outcome was presented using tables. As illustrated in the part of the study, job satisfaction, training and development, skills of supervisors and assigned quality goals were the high correlation with sewing efficiency and relationship with labor skills, working environment, rules and regulations and quality of materials were the low correlation with sewing effectiveness.*

***KEYWORDS* -** *Apparel industry**, Job satisfaction, Quality Targets, Sewing efficiency, Training and development,*

I. INTRODUCTION

The apparel industry is one of the most significant sectors in the world, with regards to production, profits, export and employment growth. Sri Lanka has become a world class apparel manufacturer supplying to global super brands for over three decades. The industry upholds high ethical practices; avoid child and forced labor thus being known to the world as a producer of "Garments without Guilt". The United States and the European Union are Sri Lanka's biggest export market for garments. Therefore, garment manufacturers must concern profit and efficiency of the production to supply their requirements on above conditions (State of the economy,2007).

The apparel industry of Sri Lanka employs about 15% of the country's workforce, accounting for about half of the country's total exports, and Sri Lanka is among the top- apparel producing countries the world relative to its population. The apparel industry provides direct employment opportunities to over 300000 and to 600000 indirectly. According to Export Development Board (EDB), Sri Lanka January, 2016 There are around 300 – 350 manufacturers of apparel. The southwest region is home to the majority of the manufacturing companies.

According to the news article of Daily Mirror (4th April 2017) it is observed that the Over the years the apparel industry in Sri Lanka has experienced a lack of labor, in particular in the recruitment of women for the position of machine operators. in this backdrop, a recent study on "an empirical investigation of labor storage in the manufacturing sector in the Sri Lanka" explores the possible explanations for the issue of labor shortages in the garment sector and proposes a possibility solution in the region.

Heikkila (2002) investigated that one of the main challenges of today's apparel manufacturing industry is to be efficient and contribute to high effectiveness, i.e. Customer satisfaction. According to the research done by Heikkila (2002) Operation manager is strictly monitored to achieve factory plan efficiency in order to match

the 3 shipment date as well as the company profit goal in garments industry. Practically, there is a gap generated between plan and actual efficiency in account of some inappropriate processing.

Of the very few studies carried out in Sri Lanka in the 20 years ending 1997, an analytical analysis carried out by Bandara & Karunarathne (2010), on productivity in Sri Lanka covering 27 industries, shows that the decline in productivity in Sri Lanka was mainly due to the decrease in technical efficiency.

According to the Vilasini , Gamage, & Kahangamage (2012) there are lots of reason negatively affect to the production efficiency such as Excessive Re-work, Rapid style change, Machine breakdown, Low Labor skill, Unnecessary activities, Daily employee absenteeism, Worker disputes, Poor information flow, Ineffective use of resources. And also "Garment industry is facing problem like low production efficiency due to high rework or rejection and poor line balancing, low flexibility of style changeover" (Paneru, 2011).

High quality product is the ultimate objective of any factory in the garment industry and also sewing efficiency is playing a vital role in the apparel sector. To achieve sales targets, retaining customers, delivery on time and consequently win the market it is necessary to maintain quality, improve machine operators" efficiency and finally factory efficiency. Especially businesses engaged in export need to maintain a higher level of quality with the higher sewing efficiency to ensure that it is a globally recognized profitable business.

Achieving a high efficiency of sewing is one of the key priorities of a garment company, since overseas customers are waiting for their requirements to be met on schedule and with lower prices. The sector is impacted unless the plant refuses to meet certain criteria. The expense of production is often exacerbated by inefficiency of weaving. If the company is able to identify the root causes of inefficiency sewing, it can take the steps necessary to increase efficiency and directly save the company time, effort and money. Therefore, this study will focus on the identification of sewing efficiency factors

II.   PROBLEM STATEMENT

The manufacturing sector plays a vital role in any economy for two main reasons. Firstly by generating direct and indirect employments and secondly by contributing to the growth of overall gross domestic product (GDP) that provides a foundation for growth in other sectors of the economy. Therefore, the development of this sector is significantly important for any country irrespective of the level of development.

According to research done by Ahmad, Amin, & Rashed (2012) operation manager is strictly monitored to achieve factory plan efficiency in order to match the shipment date as well as the company profit goal in garments industry. Practically, there is a gap generated between plan and actual efficiency in account of some inappropriate processing. According to researcher the main reason is to magnify the inefficiency level; involving uneducated people for long times in garments manufacturing industry.

"The only meaningful measure of industrial competitiveness is productivity and hence this topic is widely discussed especially in the manufacturing sector due to its solid link to the organizational profitability" (Vilasini , Gamage, & Kahangamage, 2012). Traditionally operated garment industries are facing problems like low productivity, longer production lead time, high rework and rejection, poor line balancing, low flexibility of style changeover (Paneru, 2011).

The manufacturing companies try to redefine, redesign and improve their production systems to meet the competitiveness demanded by the challenges of present markets (Dangayach & Deshmukh, 2001) However in this prevailing situation, the Sri Lankan manufacturing sector has not achieved its potential capabilities. In the manufacturing sector of the Sri Lanka the apparel sector plays vital role. Therefore, the low efficiency of apparel sector indirectly impacts to this prevailing situation.

Efficiency has a strong impact on the order and ineffectiveness, which ultimately allows orders to be postponed. This means that sewing inefficiency also means the cost of the company. If the company is able to determine causative factors of sewing inefficiency, it can take the steps necessary to improve productivity and directly save the company time, effort and money. This study focuses therefore on "What factors affect sewing efficiency of the apparel industry in relation to the district of Anuradhapura."

2.1 Research Questions

• Does human factors (labor skills, job satisfaction, training and development, supervisors, skills) affect to the sewing employee's efficiency of apparel industry in Badulla District?

• Does organizational factors (working environment, quality targets, rules and regulations) affect to the sewing employees efficiency of apparel industry in Badulla District?

• Does technical factors (material quality) affect to the sewing employee's efficiency of apparel industry in Badulla District?

2.2 Hypothesis of the Study

Based on research objectives, hypothesis of this study are as follows.

H1 =There is a relationship between sewing efficiency and labor skills of sewing employees of apparel industry in Badulla District.

H2 =There is a relationship between sewing efficiency and job satisfaction of sewing employees of apparel industry in Badulla District.

H3 =There is a relationship between sewing efficiency and training and development of sewing employees of apparel industry in Badulla District.

H4 =There is a relationship between sewing efficiency and supervisors' skills of sewing employees of apparel industry in Badulla District.

H5=There is a relationship between sewing efficiency and working environment of sewing employees of apparel industry in Badulla District.

H6=There is a relationship between sewing efficiency and quality targets of sewing employees of apparel industry in Badulla District.

H7=There is a relationship between sewing efficiency and rules and regulations of sewing employees of apparel industry in Badulla District.

H8=There is a relationship between sewing efficiency and material quality of sewing employees of apparel industry in Badulla District

III.   METHODOLOGY

The current study is conducted to investigate the factors affecting to the sewing employees efficiency of apparel industry in Badulla district. This study is based on the quantitative approaches and survey technique is based for the collection of responses.
Sample and population The population of this study is all the 875 sewing employees of 3 selected garment factories in Badulla district. Among the population of the study 100 employees in 3 selected garment factories will be selected to the sample that will faithfully cover the sewing machine employees of apparel industry in Badulla district. sample is consist with convenience selected the employees in three garment factories in Badulla district.
The objective is to be establishing the relationship between these independent variables and dependent variable. This is a basic study. Basic research is designed to add to an organized body of scientific knowledge and does not necessarily produce result of immediate practical value. The intention of this study is to determine

whether there is any relationship between dependent and independent variables. Therefore this is an analytical survey. This analytical survey is designed by using questionnaire which is including 28 questions targeting the machine operators in the garment factories in Badulla district

IV.   LITERATURE REVIEW

2.1 Efficiency

"Efficiency is doing things right" (Drucker, 2007).

Zandin(2001) defined efficiency as a measure of quantifying the quality output against the amount of input. It expresses the relationship between the good quantity of goods and services produced (output) and the quantity of Labor , capital, land, energy, and other resources to produce it (input).

According to the view of Levin, Jamison, & Radner (1976), there are several types of efficiency including productive efficiency, allocate efficiency, technical efficiency, and social efficiency, „x‟ efficiency, Pareto efficiency, distributive efficiency and dynamic efficiency.

Ahmad, Amin, & Rashed (2012)emphasis that efficiency is the major points in any manufacturing organization in order to stay alive in competitive market; Operation manager is strictly monitored to achieve factory plan efficiency in order to match the shipment date as well as the company profit goal in garments industry. Practical terms, some inappropriate treatment created a gap between plan and actual efficiency.

According to Roy, Ghosh, & Chakraborty (2012) following formula is used to calculate production efficiency of garments.

Efficiency=Produce minutes / Available minutes 100

Produce minutes = Standard Minutes Value (SMV) Production quantity

Available minutes = Number of workers Working minutes

2.2 Factors affecting to the sewing efficiency

According to Vilasini , Gamage, & Kahangamage (2012) mentioned that there are lots of reason negatively affect to the production efficiency such as Excessive Rework, Rapid style change, Machine breakdown, Low Labor skill, Unnecessary activities, Daily employee absenteeism, Worker disputes, Poor information flow, Ineffective use of resources.

"Garment industry is facing problem like low production efficiency due to high rework or rejection and poor line balancing, low flexibility of style changeover" (Paneru, 2011)

2.3 Low Labor skill

The lack of skilled labor is the major challenge facing the Sri Lankan Apparel Industry. Lack of skilled labor normally affect for the efficiency level of the factories (Liyanage & Galhena, 2009). Solinger, carr, & Latham (2008) noted that the lack of skills of the operator may create a handling problem of the fabric parts in the cause of garment manufacturing.

Silva,(2014) noted that his research to achieve high sewing efficiency level organization should be focused on the specific skills required for the job. Employers should give more attention to job related skills than paper qualifications, for which they can use tests like Purdue .The Purdue pegboard test is a timed physical test used to measure manual dexterity and brain function.

2.4 Employee job satisfaction

There are different approaches towards defining job satisfaction. According to Silva,(2014) in simple terms job satisfaction defined as the positive attitude and feelings people have towards their job If a person‟s work is

interesting, pay is fair, promotional opportunities are excellent, his or her supervisor is helpful, and co-workers are friendly it helps to satisfy the worker with their job. Furthermore, job satisfaction gain benefits to the organization includes reduction in complaints and grievances, absenteeism, turnover as well as improved punctuality, worker morale and efficiency (Ahamed, 2014).

Job satisfaction is an important element in modern industrial commercial organization, government, non-government and private sector as well as manufacturing industry. It is directly linked to productivity as well as to oraganizational efficiency (Ahamed, 2014).

When the work of an employee is interesting, the pay is decent, bonuses are fantastic, the boss is supportive and his co-workers are nice, it helps please the worker with his employment..(Ahamed, 2014).

2.5 Employee training and development

According to Jayawardana and Prasanna (2007) new employees generally have less experience than older employees. So that training is essential for new employees to involve in their new job successfully. Training is the degree to which learners use the knowledge, skills and attitudes acquired in a training context effectively". Further he mentioned that If the employees did not receive a better training they are can"t to perform their duties of the job in the expected level of the organization.

Wright & Geroy(2001) states that successful training programs improve workplace skills. This also not only increases workers' individual efficiency to conduct their present job in an efficient way, but also enhances the information and expertise required in the future by the workforce and leads to their superior organizational achievement.

According to Baldwin & Ford (2005) view, new employees receive duties but those employees generally not have any experience than older employees. So training is essential for new employees to involve and adapted in their new job successfully. If the employees did not receive a better training they are can"t to perform their duties of the job in the expected level of the organization.

Organizations should give priority to employee training. Employee training is essential for organizational success since it educates workers about the effective use of technology, thereby improving productivity and efficiency. (Silva,2014)

2.6 Supervisors' skills

The know-how and expertise of sewing supervisors help machine operators indirectly in the best direction to execute the activities. State that the supervisor should help to clarify expectations of performance following training, determine the possibility of applying new skills and knowledge, work with people with problems when applying new skills and provide feedback on new skills when people successfully use them. Executives influence on employees and force them to achieve planned targets with the expected quality levels. Forcing can be affected to lose the existing quality levels with increasing defects. (Lu, 2012)

2.7 Physical Working environment

Parimalam (2006) investigated on the environmental factors of Garment Industry and its effects. They concluded that congested work area, improper ventilation, dust, excessive noise, high temperature and humidity inside the apparel plant are the major problems.

According to Kekana, Du Rand, & Van Wyk (2012) "Organizational factors and poor working conditions were strongly associated with job performance". People respond unfavorably to restrictive work environments so it is imperative for organizations to create a working environment that gives employees the ability and freedom to think, engaging and motivating the work force to reach a higher level of job performance

2.8 Assigned Quality Targets

The quality of garments is very important to its survival in an increasingly competitive Apparel Industry in order to maintain the production of high quality garments and improved productivity in the factory. The main problem

in the Apparel Industry is the high defect rate. As a result of that, the rate of production is not as high as expected and also the factory cannot achieve their targets. (Seneviratna, 2013)

The employers should give a clear idea about the organizational short term and long term targets. This way every employee in the plant will know what is expected of them and the speed with which the task is to be performed (Silva,2014)

2.9 Rules and Regulations

"Company Rules and Regulations" that apply to all contractors and contractor"s workforce; hygiene, safety and dress codes; directions made by company representatives; and other rules and regulations, codes, policies and procedures that may be applicable to efficiency of the company. According to Pendleton (2015) from time to time ,workers may violate the policies established for business.Even if an employee breaks the rules with the best of intentions the flow of the workplace can be impacted negatively.

2.10 Material quality

Fabric is the major material which is used in the garment industry. It is necessary to determine the most appropriate seam for each type of fabric to achieve a desired product quality. Fabric quality is related to the performance sewing. Declares the fiber content influences the overall characteristics of a fabric. Understanding the components of the fabric and the quality of the seam will ensure the best performance for that particular product.

Apparel consumers are generally paying attention to appearance, comfort, and wear ability of fabric and evaluate seam quality based on the seam appearance and its mechanical intactness after wear and care procedures of apparel. Not only does the development of garments from premium fabrics provide the user warmth but also tends to function seamlessly throughout the manufacturing cycle. (Choudhary & Geol, 2013).
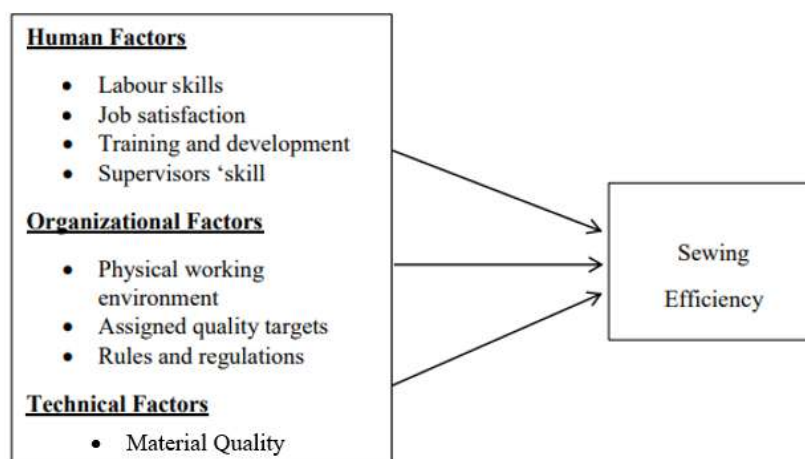
2.11 Conceptual Framework

Figure 1: Conceptual framework

V.   METHODOLOGY

2.1 Sample profile

The samples of the study consist with 100 employees work in apparel industry.

		Gender		Total
		Female	Male	
Age	Less than 20	14	3	17
	20-30	38	2	40
	30-40	17	2	19
	40-50	18	0	18
	More than 50	5	1	6
Total		92	8	100

Table 1: Age and Gender Distribution

Above table shows the age and gender distribution of the selected sample. Age is divided into five categories and according to the above table majority of the respondents are within the age group 20-30, it represents 40 percent from the survey. The lowest level, which is more than 50 years old, is the last. Among the 100 workers, it is restricted to 6 employees.40% and 19% of respondents represent 20-30 and 30 -40 age groups respectively. No any male employees include in 40-50 age category.

		Marital status		Total
		Married	Unmarried	
Working experience	Less than 1 year	9	22	31
	1-3 years	14	8	22
	3-5 years	10	6	16
	5-7 years	10	3	13
	More than 7 years	16	2	18
Total		59	41	100

Table 2: Working experience and marital status distribution

According to Table 02 above, the employees ' job experiences are grouped into 5 categories. The 31 workers constitute the community category with less than 1 year of experience and most of them are unmarried. Employees in the last category for 7 years are limited to 18. There are 22 employees in the 1-3 year experience group category, and 16 and 13 employees in the 3-5 and 3-5 year experience category. 59 married workers and 41 unmarried workers comprise the overall sample.

variable	Conbrach alpha
Labour skills	0.714
Job satisfaction	0.781
Training and development	0.878
Supervisor skills	0.801
Working environment	0.751
Quality targets	0.629
Rules and regulations	0.746
Material quality	0.656
Sewing efficiency	0.698

Table 3:Reliability Analysis

Table 03 shows that the variables' reliability is closer to or greater than the minimum agreed standard of 0.65. Accordingly, the reliability tests run for each collection of question items used to measure each study variable were able to conclude that the variables had been accurately calculated by the questionnaire created.

The alpha value is used here to assess the reliability of the questionnaire and all the variables such as labor skills, job satisfaction , training & development, supervisor skills, working environment, quality objectives, rules & regulations, material quality and sewing performance that are above 0.65 in the alpha value were agreed by the variables in the questionnaire.

Descriptive Statistics

By using descriptive statistics to describe their specific existence, this section analyzes individual variables. Researchers try to classify the degree of responses provided by the sample in relation to each independent variable and dependent variable. Standard deviation, skewness and other measurements were calculated for this suggested mean and are listed in Table 04 below.

	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Std. Error
LS	3.9700	.72062	-.182	.241
JS	4.0233	.70154	-.353	.241
TD	3.9850	.71934	-.798	.241
SS	4.2167	.61294	-.274	.241
WE	4.1875	.53816	.096	.241
QT	3.7950	.81988	.265	.241
RR	4.0350	.65619	-.132	.241
MQ	4.1350	.61074	-.128	.241
SE	4.1150	.47197	.027	.241

Table 4:Descriptive Statistics

According to above Table 04 mean value for all the independent and dependent variables such as labor skills (M=3.9, SD=0.72), job satisfaction (M=4.0, SD=0.70), training and development (M=3.9, SD=0.72), supervisors skills(M=4.2, SD=0.61) ,working environment(M=4.1, SD=0.54), quality targets(M=3.7, SD=0.82), rules and regulations(M=4.0, SD=0.66), material quality(M=4.1, SD=0.61) and sewing efficiency(M=4.1,

SD=0.47)among the employees of the selected industry is significantly high and not much deviation among the employees.

2.2 Analysis of the Demographic Factors

The different demographic characteristics of the workers independent sample t-test and ANOVA were used to test if sewing performance is different. Their results are listed in the table below.
Independent sample t-tests were conducted to determine whether there is a substantial difference between male and female sewing performance. Their results are shown in Table 5 below.

Gender	Mean	Std. Deviation	t value	Sig.
Female	4.1250	.48110	2.908	0.475
Male	4.0000	.35355		

Table 5: Result of t-test (Gender and sewing efficiency)

According to the above table, the mean value of both female and male respondents was higher (M= 4.12) (M= 4.0). The outcome of the t-test further shows that there is no substantial difference in sewing performance between these two classes (t= 2.908, p > 0.05).
Differences in the sewing efficiency of the respondent's age group were achieved by one-way ANOVA. Its performance is shown in table 6.

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.727	4	.182	.810	.522
Within Groups	21.325	95	.224		
Total	22.053	99			

Table 6: Result of ANOVA (Age and sewing efficiency)

The result of ANOVA shows that the sewing efficiency of the respondents for their age category IS does not vary between at least two classes (F=0.810, P>0.05).
In addition, variations in sewing effectiveness were identified by one-way ANOVA on the respondents' working experience. The findings are recorded in the following table 7.

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.389	4	.347	1.597	.182
Within Groups	20.663	95	.218		
Total	22.053	99			

Table 7: Result of ANOVA (Working experience and sewing efficiency)

The result of ANOVA test reveals that sewing efficiency of the respondent is no different between at least two groups on their working experience (F=1.597, P>0.05).

2.3 Correlation Analysis

The correlation defines the direction of the correlation, i.e. whether it is positive or negative, and the intensity of the correlation, i.e. whether it is strong or weak in an established correlation. The intensity is calculated by the coefficient value, while the sign indicates whether the variable shifts in the same direction or the opposite direction. Correlation analysis was used to classify the interrelationship between main study variables, and the findings are listed in Table 4.8.

	Labor skills	Job satisfaction	Training and Development	Supervisors Skills	Working environment	Quality Targets	Rules and Regulations	Material Quality
Sewing efficiency	.151 (0.113)	.358 (0.000)	.392 (0.000)	.285 (0.004)	0.168 (0.095)	0.460 (0.000)	0.117 (0.245)	0.125 (0.215)

Table 8: Result of Correlation Analysis

Correlation values of both independent and dependent variables are shown in Table 8. The Pearson Correlation coefficient of 0.151 reflects a positive association between sewing productivity and labor skills when considering the correlation between dependent and independent variables. There is no sense here, the value is 0.113. The result here is support for the study's first hypothesis (H1). It is not, however, significant.

There is a strong and optimistic link between sewing effectiveness and job satisfaction, as the correlation coefficient of these two variables is numerically 0.358 at the level of significance of 0.000. It provides evidence for the study's second hypothesis (H2).

There is a correlation of 0.392 between sewing effectiveness and training & growth. This suggests that there is a strong positive association between sewing success and training & development. There is an important relationship between them here, with a significant value of 0.000. And the study's third hypothesis (H3) is also endorsed.

A strong and positive correlation can be seen between sewing performance and the expertise of the supervisors, as the correlation coefficient of these two variables is numerically 0.285 at the important level of 0.004. Support for the fourth hypothesis (H4) is given.

The Pearson Correlation coefficient of 0.168 is an insignificant correlation between the degree of sewing productivity and the working environment. The relevant value here is 0 .095. But there is support for the fifth (H5) hypothesis.

At the 0.000 significance mark, the Pearson Correlation coefficient of 0.460 reflects an important correlation between the level of sewing performance and quality goals. Support for the sixth hypothesis (H6) is found here.

There is a correlation of 0.117 between sewing efficiency and regulations and rules. It demonstrates that there is no major relationship between regulations on sewing performance and laws. In this case, 0.245 is a meaningful value. But this is in support of the seventh research hypothesis (H7).

The Pearson Correlation coefficient of 0.125 is also an insignificant correlation between the degree of sewing efficiency and the quality of the material. Here, 0 .215 is a substantial value. The eighth hypothesis (H8) is also endorsed here

2.4 Regression Analysis

The previous chapter discusses the connection between main research factors. Using regression analysis, this section aims to analyze certain relationships. Sewing performance was entered in regression analysis as dependent variable and labor skills, job satisfaction , training and development, supervisor skills, working environment, assigned quality goals, rules and regulations, and as predictors were entered as material quality.

Table 9 shows the Model summery .R value represent the multiple correlations between sewing efficiency and other predictor variables.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.590ª	.348	.283	.39957

Table 9: Regression analysis (Model summary)

R^2 's value is 0.283. Which represents eight predictor variables that can account for 28.3 percent of the sewing efficiency variance. This implies that these eight predictor variables alone do not explain 28.3 percent of the variance in sewing quality. There must, therefore, be other factors that have an effect on sewing quality.

F value=5.851		Sig .=000			
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.805	.489		5.736	.000
LS	-.100	.066	-.152	-1.506	.136
JS	.162	.077	.240	2.085	.040
TD	.164	.072	.249	2.260	.026
SS	.098	.092	.127	1.060	.292
WE	-.277	.111	-.315	-2.483	.015
QT	.238	.061	.413	3.878	.000
RR	.055	.066	.077	.841	.403
MQ	.089	.070	.115	1.274	.206

Table 10: Regression Analysis (coefficient table)

Using the ANOVA table, the fit of the regression model can be calculated, and if the P value is less than .05, the model is important. The significance value is .000, depending on the value of the ANOVA table. Thus, researchers affirm the model's significance.

The regression coefficient of labor skills indicates that there is not a relationship with sewing efficiency (β= -0.100, p>0.05).The result is not support to the first hypothesis (H1) of the study. Job satisfaction regression coefficient specifies that there is a relationship with sewing efficiency(β=0.162, p<0.40) and result further support the second hypothesis(H2).The regression coefficient of training and development points out that there is a relationship with sewing efficiency (β=0.164, p<0.05)and result also support the third hypothesis (H3). Since the regression coefficient 0.098 of supervisors" skills denotes that there is not a relationship with sewing efficiency and hypothesis (H4) of the study is not supported. Working environment regression coefficient specifies that there is a relationship with sewing efficiency(β=-277, p<0.05) and result further support the fifth hypothesis(H5).The regression coefficient of quality targets points out that there is a relationship with sewing efficiency(β=0.238, p<0.05) and result also support the hypothesis (H6).The regression coefficient 0.055 of rules and regulations denotes that there is not a relationship with sewing efficiency and hypothesis (H7) of the study is not supported. The regression coefficient of material quality 0.089 also specifies that there is not a relationship with sewing efficiency and hypothesis (H8) of the study is not supported.

According to the results of the regression analysis the regression model can be developed as follows.

$FAS = \beta_0 + \beta_1 LS + \beta_2 JS + \beta_3 TD + \beta_4 SS + \beta_5 WE + \beta_6 QT + \beta_7 RR + \beta_8 MQ \, ei$

$FAS = 2.805 + (-0.100) + 0.162 + 0.164 + 0.098 + (-0.277) + 0.238 + 0.055 + 0.089$

2.5 Hypothesis Testing

According to the correlation sig value of job satisfaction, training and development, supervisors' skills and quality targets these factors are significant and hypothesis are acceptable. Labor skills, working environment, rules and regulations and material quality are not significant under the correlation analysis and hypothesis of those factors are rejected.

According to the regression analysis job satisfaction, training and development, working environment and quality targets are significant and hypothesis of those factors are acceptable. Labor skills, supervisors' skills rules and regulations and material quality are not significant under the regression analysis and hypothesis of those factors are rejected.

VI.   CONCLUSION RECOMMENDATIONS

The main purpose of the research was to identify the factors that are most likely to impact on the sewing employees'' efficiency of the apparel industry in Badulla district. Eight hypotheses were established and four of those accepted while four hypotheses were rejected.

Efficiency fluctuations seriously affect to the total production and it is cause to decrease the efficiency level and also increase pressures towards the employees and management because they have directed to responsible to target production units. In here these findings was able to identify the number of factors that are influencing on the sewing efficiency in apparel sector.

Analysis data shows that there are high relationship between sewing efficiency and job satisfaction, training and development, rules and regulations and material quality. Thus analyzed data revealed that there are no relationship between sewing efficiency and Labor skills, supervisors'' skills, rules and regulations and material quality

The apparel sector encounters the problem of law level of sewing efficiency. It should be engaged in the implementation of efficiency provident procedures as soon as possible. Here the following recommendations were provided in order to improve the significant sewing efficiency and also to improve the quality levels of the garments.

•   Observing the machine operators for correct machine handling and fabric handling (material quality) and make necessary arrangements to provide sufficient knowledge to the machine operators about the fabric types.

•   Encourage sewing machine operators to check the finished operations by themselves before transferring it to another party (quality targets).

•   Setting individual targets instead of giving equal targets for all sewing machine operators and give achievable production targets for sewing machine operators.

•   Design workstation layout based on operation requirements to reduce unnecessary motions.

•   To improve the sewing efficiency of the apparel industry in Badulla district, machine operators should be trained. They should be introduced newly introduced processes, procedures and other tools regarding sewing of the apparel.

•   Properly maintain the introductory training programmed .Monitoring and controlling is needed until the employee induct to the new working environment. When new employees recruit to the job it is essential to give an induction period for them to adapt the organizational culture. It will be motivate the new employee for the job.

REFERENCES

[1].   Ahamed, F. (2014). Job Dissatisfaction in the Bangladesh readymade garment to what extend HR/IRPractices can grow exhilaration of RMG workers. Internal Journal of Business and Management Review, 2.

[2]. Ahmad, S., Amin, B., & Rashed, C. (2012). Impact of efficiency in apparel supply chain. Asian journal of natural & applied sciences, 1, 31.

[3]. Appiah, B. (2010). Impact of Performance Appraisal on Employee Performance. Journal of Resources Development and Management.

[4]. Armstrong, M. (2006). A hand book of Human Resource Management Practice. London: Kogan Page Publishers.

[5]. Attwood, M., & Dimmock, S. (1996). Personal Management (Third edition ed.). Chelsea: Lewis Publication Inc.

[6]. Bandara, M. Y., & Karunarathne, D. N. (2010). An empirical analysis of Sri Lanka's Manufacturing Productive slow-down. Journal of Asian Economics 21, 391-403.

[7]. Chatterjee, B. (1999). Executive Guide to Human Resource Management (Fourth edition ed.). Welley India, India.

[8]. Chawla, A. (2009). Milk and Dairy Products in India – Production, Consumption and Exports (2 ed.). Hindustan Studies & Services Ltd.

[9]. Choudhary, A. K., & Geol, A. (2013). Effect of some fabric and sewing conditions on Apparel seam characteristics. Journal of Textile, 7.

[10]. Collins, K., Jones , M., McDonnell, A., Read, S., & Jo. (2000). Do new roles contribute to job satisfaction and retention of staff in nursing and professions allied to medicine. Journal of Nursing Management, 8, 3-12. xiv

[11]. Dangayach, G., & Deshmukh, S. (2001). Manufacturing Strategy:Literature Review and Some Issues. International Journal of Operations and Production Management, 21(7), 884-932.

[12]. Drucker, P. F. (2007). The Practice of Management. California: Josseybass.

[13]. F, N., R, M., & M, I. (2015). Improving Sewing Section Efficiency through Utilization of Worker Capacity by Time Study Technique. International Journal of Textile Science , 1-8.

[14]. Fonseka, T. (1999). Best Management Practices in Sri Lanka:Manufacturing sector. Journal of comparative international management, 2.

[15]. Funmilola, O. F., Sola, K. T., & Olusola, A. (2013). Impact of job satisfaction dimensions on job performance in a small and medium enterprise in Ibadan, South Western, Nigeria. . Interdisciplinary Journal of Contemporary Research in Business, 4(11).

[16]. Heikkila, J. (2002). From supply to demand chain management:efficiency and customer satisfaction. Journal of Operations Management, 747-767.

[17]. Hiba, J. C. (1988). Improving Working Conditions and Productivity in the Garment Industry. 1-166.

[18]. Hitihamu, S., & Epasinghe, S. (2015). MA Economics from Savitribai Phule Pune University. Hector Kobbekaduwa Agrarian Research training Institute .

[19]. Hwang, B., & Yang, S. (2014). Rework and schedule performance: A profile of incidence, impact, causes and solutions. Engineering, Construction and Architectural Management, 21(2), 190 - 205.

[20]. Jain, T. (2006/2007). Principles of Economics. New Delhi: V. K. Publishers.

[21]. Jayawardana, A., & Prasanna, H. (2007). Factors Affecting the effectiveness of Training provided to Merchandisers of Garment Industry in Sri Lanka. Sri Lankan Journal of Management, 172. xv

[22]. Kekana, H., Du Rand, E., & Van Wyk, N. (2012). Practice environment,job satisfaction andburnout of critical care nurses in South Africa. Journal of Nursing Management13, 20(5), 286-295.

[23]. Koontz, H. (1990). Essentials of management (Fifth edition ed.). Cape Town: Oxford.

[24]. Levin, H. M., Jamison, D., & Radner, R. (1976). Concepts of Economic Efficiency and Educational Production. National Bureau of Economic Research, 149-198.

[25]. Liyanage, D. M., & Galhena, B. L. (2009). Determinants of Turnover Intention of Sewing Machine Operators. Case from Leading Apparel Company, 1-17.

[26]. Lovell, K. (1993). Measuring Production Efficiency of Readymade Garment Firms. Journal of Textile and Appal,Technology and Management, 6(2).

[27]. Lu, J. L. (2012). Work and stress among supervisors in selected industries in the context of a globalized Labor production.

[28]. Majumder, P. P., & Begum, A. (2000, June). The gender imbalances in the export oriented garment industry in Bangladesh. 1-42.

[29]. Mandal, S. (2008, August). Studies on Seam Quality with Sewing Thread size stitch Density and Fabric Properties. 1-287.

[30]. Mazedul, M. I., Maroof, A. K., & Mashiur, M. K. (2013). Minimization of Defects in the Sewing Section of Apparel Industry. Research Journal of Management Science, 2(8), 10-15.

[31]. Mfowabo, N. (2006). The impact of Total Productive Maintenance (TPM) on Manufacturing Performance at the Colt Section of Daimier Chrysier in the Eastern Cape. Eastern Cape: Nelson Mandela Metropolitan University.

[32]. Muhammad , A. A. (2014). IMPORT – EXPORT BUSINESS PLAN. Bachelor's Thesis of Degree Program in International Business .

[33]. Nabi, F., Mahmud, R., & Islam, M. M. (2015). Improving Sewing Section Efficiency through Utilization of Worker Capacity by Time Study Technique . International Journal of Textile Science, 1-8. xvi

[34]. Nair, N. (2017). What is the government structure of India. MA Economics from Savitribai Phule Pune University .

[35]. Nassazi, A. (2013). Effects Of Training On Employee Performance. 57 + 2.

[36]. Nearest.Expert (https://www.indiafilings.com/expert/). (n.d.). Retrieved from Learning Center (https://www.indiafilings.com/learn/).

[37]. Nel , P., Van Dyk, P., Haasbroek, G., Schultz, H., & Sono. (2004). Human Resource Management.

[38]. Paneru, N. (2011). Implementation of lean manufacturing tools in garment manufacturing process focusing sewing section of Men‴s Shirt. Degree Programme in Industrial Management.

[39]. Parimalam, P. (2006). Ergonpmic interventions to improve work environment. Indian Journal of Occupational and Environmental Medicine, 74-77.

[40]. Pendleton, E. (2015). The importance of obeying the rules and regulations in the workplace.

[41]. Ramasodi, J. M. (2010). Factors Influencing Job Satisfaction among Healthcare Professionals at South Rand Hospital. University of Limpopo.

[42]. Ranawana , S. (2008). Dairy Industry in Sri Lanka: Problems and Prospects. Faculty of Livestock, Fisheries and Nutrition, Wayarnba University of Sri Lanka.

[43]. Roy, S. S., Ghosh, S. K., & Chakraborty, R. (2012, January). Application of Industrial Engeeniring in Garments Sewing Floor. 1-79.

[44]. Roy, S., Ghosh, S., & Chakraborty, R. (2012). Application of Industrial Engineering in Garment sewing floor.

[45]. Sekaran, U., & Bougie, R. (2010). Research Method for Business. (5, Ed.) India: Welley.

[46]. Seneviratna, N. (2013). Application of Generalized Linear Model to the Minimization of Defectives in Sewing process of Apparel Industry. International Journal of Scientific & Research Publications, 3, 1-6. xvii

[47]. Silva, M. M. (2014). The ImpacT of Job SaTISfacTIon and employee educaTIon on employee effIcIency. Social Affairs: A Journal for the Social Sciences , 30-51.

[48]. Solinger, carr, & Latham. (2008). Technology of Clothing Manufacture. Indian Journ lof Fiber and Textile Research, 78, 344.

[49]. Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Sysstematic Review. British Journal of Management, 14, 207-222.

[50]. Vilasini, P., Gamage, J., Kahangamage, U., & Thibbotuwawa, N. (2012). Low Productivity and Related Causative Factors. A Study Based on Sri Lankan Manufacturing Organizations.

[51]. Weerahewa, J., & Rajmohan, K. (2008). Global Dairy Markets: Implications for Sri Lanka . Department of Agricultural Economics and Business Management.

[52]. Wright, P., & Geroy, D. G. (2001). Changing the mindset: the training myth and the need for word-class performance. International Journal of Human Resource Management , 586–600.

[53]. Zandin, K. (2001). Maynard's Industrial Engineering Handbook (5 ed.). McGraw-Hill.