



# Factors Affecting the Efficiency of Human Resources in Guilan's Rice Processing Industry

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## Abstract

The main objective of this study was to identify and explain the factors affecting the efficiency of human resources in the processing industry (rice) in Guilan Province. The statistical population consisted of officials and personnel working in rice mills that had at least a high school diploma and experts on rice processing industry in Agriculture Organization that, according to the relevant authorities, 3750 people in rice workshops and 130 people were working in the Agricultural Jihad Organization in Guilan Province. Out of them, a sample of 350 participants were selected by stratified and cluster sampling. To collect data, labor productivity questionnaire and ACHIEVE model containing 24 items were used. The reliability of this study was estimated by a Cronbach's alpha, which was equal to 0.90 and was indicative of high reliability of the questionnaire. To analyze the data, one sample t-test was employed using SPSS software. The results of the study revealed that employees had the required ability, understanding, organizational support, motivation, feedback, reliability, and compatibility. The results also suggested that there was not statistically significant difference between men and women in terms of the productivity of human resources. Human resources productivity was different between different age groups. According to the average productivity of human resources in different age categories, the average productivity of human resources among people ranging in age from 20-30 years was more likely than others. Analysis of variance in comparing the average of the four groups (diploma, associate degree, undergraduate, and graduate) with a significant level up to 0.05 showed that there was no statistically significant difference between people with different educational levels with the efficiency of human resources.

### Keywords:

human resources; productivity; rice processing industry

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## INTRODUCTION

One of the most important factors of production in any organization is its human resource. In other words, human resources can be regarded as one of the important aspects of the organization. Man is the greatest and most valuable asset of the organization, which is never reflected in the company' balance sheet and profit and loss statements while organization profitability is with humans and humans are backing the success of the organization. In general optimum use of human resources is one of the primary objectives of any organization (Mousazadeh & Amir Ismaeili, 2011).

The importance of small businesses in economic development has followed the increasing attention of policymakers in various countries. Industrial and manufacturing jobs, mostly managed in the form of mass production are different in terms of changing tasks and analysis of the problem and the difference is effective on the task performance of human resource management (Seyyed Taghavi, 2010). Basically, in most developed countries of the world, adopting policies to support small and medium-sized firms to reduce poverty and create jobs are considered as the most important development priorities of government. Since the primary or main level to reduce or increase the efficiency of the organization is its human resources, one of the things that will involve managers of leading organizations in the coming decades is the effort to increase job productivity (Ansari et al, 2011). It seems that the pattern of country policy-makers to promote human capital must be considered as one of the essential strategies for productivity growth and ultimately economic growth. To study the performance of labor productivity during country's development programs indicated its low growth (Komijani et al., 2012).

One of the important economic sectors in the country's economic development is agricultural processing industry. This industry compared to other industrial activities is considered as the beginning industry. In other words, industries that often in the early stages of the formation of different societies economy begins at the top and remain at the highest levels of economic

growth and development as well as inevitable as part of the economic activities of communities. Rice production in Guilan Province, among agricultural activities, is the most important activity that has long be considered a strategic commodity that is among the most important human foods has a special place. Given that rice, unlike other crops does not end in the field of process and most research has been conducted on this product focused on the process of planting, maintenance and harvesting it and since the study of any system efficiency is an issue that is related to all elements of the system and one of the most valuable and the most vital resource in promoting high efficiency of organizations is human resources, therefore a method must be utilized for measuring the efficiency of resource that can provide a comprehensive picture of efficiency system. Accordingly, what is needed for true management of human resources is recognition of the factors affecting the performance of the resources (Fallahi & Sojudi, 2011).

According to the theoretical foundations of research must be acknowledged that the activities of any organization are influenced by a combination of factors that the identification and review of these factors can help improve the activities and organizational goals (Allahverdi et al., 2010).

This study, while investigating the various factors affecting the productivity of human resources that is recognized by theoretical studies of models and efficiency theories, is trying to show these factors can truly affect the productivity of human resources using different patterns.

In today's competitive world, productive human resources are considered the most important asset for organizations that could change in the organization and provide basic results (Vaezi & Vosoughi, 2010). Given that the dimensions of intellectual capital (human, structural and relationship) are associated with efficiency, increased productivity can be achieved through the work of an intelligent and informed (Jahangirfard & Amiri, 2013). Many factors can affect an organization's productivity growth. Some of these factors include manpower, equipment, tools, and accessories (Mehraban et al., 2011). Labor productivity is the most important measure

of efficiency, because labor productivity is associated with most organizational analysis. Manpower is also the most convenient measurable data (Etemadi et al., 2009). Marshall (2007) suggested that developing human resources is the most valuable investment. In the history of productivity, initially little attention was put to labor productivity and more progress was in the area of productivity which is called capital productivity (Sharifzadeh & Mohammadi Moghadam, 2009). Several models have been proposed to increase productivity at different levels. These models are different in terms of considering factors (such as inputs, process or outputs) and in terms of quality and quantity. The following are some important models that focus more on the human and labor productivity.

• **Souter Meister model**

In this model, the interactions of factors affecting the productivity of the labor force are stressed. Souter Meister (1985) in his model notes two important factors affecting labor productivity, which include technology development and motivation of employees. In his view, the relationship between satisfaction, morale, job performance and productivity is much more complicated than can be imagined (Deetlefst et al., 1989).

• **Crest model**

In this model, agents that are involved in improving the efficiency of human resources are set in the form of CREST word and these factors to achieve productivity, to improve their situation should be changed in a positive direction. These factors include: commitment and communication, respect, eagerness, security and training (Heap, 1992).

• **Hershauer and Ruch model**

Hershauer and Ruch offered a server model systems to improve employee productivity. In this model, workforce is the core of model that directly or indirectly affects individual and organizational factors. Anything in this model can be imported as an input and affect workforce performance, and other factors also can be considered as the output for workforce performance. This model is the result of feedback and time delay feature. This means that the result of an action

by a person or group will eventually affect the same person or group (Alwani & Ahmadi, 2001).

• **Kate Davis and John Neyo Storm model**

In view of Kate Davis and John Neyo storm's Model (1986), factors affecting labor productivity include: quality of leadership, mutual confidence between workers and employers; organizational bilateral relationship; fair rewards; clarity of jobs and employee participation; possibility of staff development (Goudarzvand Chegini et al., 2014).

• **Hersey and Goldsmith model**

ACHIEVE model is one of productivity models that were designed by Hersey and Goldsmith (1980) in order to help managers to determine the cause of performance problems and to create change strategies in order to solve these problems. To develop a model for human performance analysis, Hersey and Goldsmith (1980) had two main goals in mind: The first step in ACHIEVE model is to pay attention to the ability followers. The followers to some extent must have the desire and skills necessary to carry out assignments. In the second step, Porter and Lawler (2001), by adding role image or independent understanding, extend this idea that followers to do everything right and duty must have a correct understanding of how to do it. ACHIEVE model considers effective the feedback which includes everyday training and formal evaluation of performance in individuals. Hersey and Goldsmith (1980) have chosen seven variables related to effective performance management. By combining the first letters of each functional variable raised seven-letter word ACHIEVE which stands for Ability, Clarity, Help, Incentive, Evaluation, Validity and Environment (Khaki, 1998). In other words, in their model, the performance and efficiency is a function of seven factors:

$$P=f(A, C, H, I, E, V, E)$$

P=Performance; A=Ability and the power to accomplish a task successfully; C=Clarity (Tasks, how to do it, etc.); H= Organizational support; I= Incentive (Passion and inner desire to do homework without coercion); E=Evaluation

(Understanding how the mechanisms and aspects of the activities); V=Validity (Appropriate and legal, and legitimate management decisions) and E=Environment (External effective factors) (Hersey & Goldsmith, 1980).

Rivera-Huerta et al. (2011) in his study that

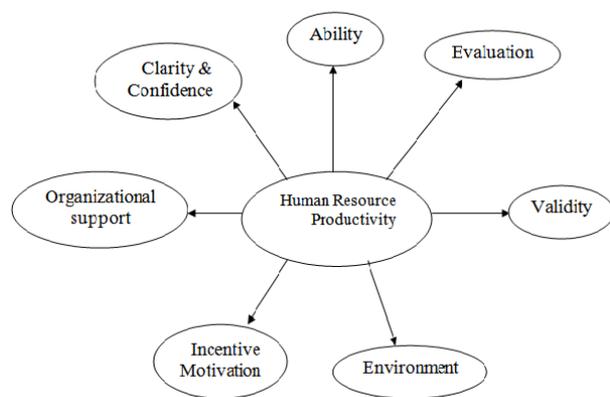


Figure 1. Research Model on based of ACHIEVE Model

raised the question of whether the relationship between farmers and university researchers could affect researcher productivity, thus examining how much research productivity in agriculture is influenced by the nature of interactions between academics and farmers. This is done through two dimensions: the extent of communication and intensity. Also according to data collected by researchers at the university and agricultural research centers, three models have been developed. Moreover, the researchers found that the effect of the nature of interactions on research productivity varies according to the type of research output (Rivera-Huerta et al, 2011). In addition, Mehrabi Basharabadi et al. (2011) investigated factors affecting the capital productivity in the agricultural sub-sector of Iran. In this study, in order to calculate the average productivity of capital in 2004-2007 in the agricultural sub-sector of Iran, generalized mean productivity method and to determine the factors influencing it, the panel approach was used. The results showed that labor-capital and human capital ratio had positive effect on productivity in the Agricultural sub-sector of Iran. The results also suggested that fishery and forestry sector had the highest average generalized productivity

in the studied period. According to the ratio of human capital per unit of positive effect on capital stock productivity, In order to make effective use of production technology, qualified personnel in this sector should be absorbed (Mehrabi Basharabadi et al., 2011). Mousavi and Mir Mohammad Sadeghi (2012), in the study of factors affecting labor productivity in major crop producing central part of the Mamasani city, showed that among the factors that influenced labor productivity are age, experience, gender, education level, size, participation in training and promotion programs, as well as banking facilities. The results also showed that variables such as supervisor education level to read and write, size, membership in cooperatives, participation in training, and promotion programs had positive effects on labor productivity; however, variables such as upper secondary education level of supervisor, supervisor experience, and the loan amount received to the current cost ratio negatively affects labor productivity (Mousavi & Mir Mohammad Sadeghi, 2012).

### Research questions

The main question: Do the staffs of Guilan rice processing industry have the required efficiency?

### Sub-questions:

1. Do the Guilan rice processing industry employees have the required ability?
2. Do the Guilan rice processing industry employees have the required understanding?
3. Do the Guilan rice processing industry employees have the required organizational support?
4. Do the Guilan rice processing industry employees have the required motivation?
5. Do the Guilan rice processing industry employees have the required feedback?
6. Do the Guilan rice processing industry employees have the required validity?
7. Do the Guilan rice processing industry employees have the required compatible with environment?
8. Is there relationship between demographic variables (age, sex, education) of employees in enterprises and the efficiency of human resources?

**MATERIALS AND METHODS**

In this study, two populations have been used: the first populations were forces working in rice mills grinding with graduates educated in Guilan, that according to the reporters of relevant authorities and due to more mechanized workshops, almost 3750 participants were working in rice mills workshop in the province. The second population comprised experts in the Department of Agriculture were working in the rice processing industry that, according to the reporters of relevant authorities, people working in the population were 130 people that all, because of the small size population, were chosen as the sample of this study. The sampling method used in this research was a combination of stratified and cluster sampling. Yet, in the first population, multi-stage sample selection was used that will be explained in much detail later. In the first phase, the first population that included staff working in rice mills in Guilan Province was divided into 10 categories as follows:

It is noteworthy that the population of each class is the number of people employed in the rice mill workshop in the same city. In addition, in order to collect data for analysis, a questionnaire were used. Indicators measured in the study before survey in the form of questionnaire were judged by professors and advisors. Finally, an agreed questionnaire was used to collect data. The questionnaire was divided into two sections:

A) General questions: In this part of the questionnaire, general demographic information about the respondents to be collected. The information is about the characteristics of age, gender and educational level of respondents.

B) Specific questions: this section is dedicated to the hypotheses. For the assessment of labor productivity, the standard questionnaires ACHIEVE was used. Inventory labor productivity is based on ACHIEVE model provided by Hersey and Goldsmith in 1980. The questionnaire with 26 questions with Likert type deals with

Table 1  
The sample size for class of the first population

Class	City name	The population of each category (person)	The sample size in each category (person)
1	Rasht	1100	65
2	Talesh	230	13
3	Astaneh	250	15
4	Lahijan	550	32
5	Langroud	300	17
6	Roudsar	350	20
7	Shaft	220	13
8	Soumesara	280	16
9	Fouman	240	14
10	Masal, Siyahkal & Roudbar	60,80,90	4,5,6
	Total	3750	220

Table 2  
Cronbach's Alpha Coefficient

Independent variables	Cronbach's alpha
Ability	0.73
Clarity	0.77
Organizational support	0.82
Incentive	0.83
Evaluation	0.76
Validity	0.79
Environment	0.83
Total item	0.90

Table 3  
Statistics on variables

Variable	Average	Mean	SD
Ability	3.18	3.33	0.68
Clarity	3.09	3	0.77
Organizational support	3.06	3	0.86
Incentive	2.997	3	0.82
Feedback	3.055	3	0.74
Validity	3.22	3	0.78
Environment	3.41	3.33	0.82

Table 4  
One-Sample t-Test for Variables

	t-statistic	df	95% confidence interval for the mean H1	
			Low	High
Ability	4.62	305	-∞	3.25
Clarity	2.05	305	-∞	3.16
Organizational support	1.34	305	-∞	3.15
Incentive	-0.07	305	-∞	3.07
Feedback	1.3	305	-∞	3.13
Validity	2.87	305	-∞	3.2
Environment	6.72	305	-∞	3.39

seven dimensions or factors affecting labor productivity. Dimensions from ACHIEVE model include: Ability, Clarity, Help, Incentive, Evaluation, Validity and Environment. In order to assess the validity of the questionnaire, the opinions of experts and professors to the validity of the questionnaire was confirmed. To determine the reliability of the questionnaire in this study, a Cronbach's alpha was used.

According to the table above, it sees that the Cronbach's alpha coefficients of the variables are up to 0.70. Accordingly, it can be said that the main variables featured a high reliability index. In this study, in order to analysis the results obtained from the sample and the population, descriptive and inferential statistics were used. Descriptive statistics were used to summarize the data in the form of tables and graphs, and inferential statistics were used to analyze the results and test the hypotheses. For the normal distribution assumption is related to variables, Kolmogorov-Smirnov test was used. In addition, to examine the hypotheses, one-sample t-test was used.

## RESULTS

In terms of the studied frequency of gender, the highest percentage was accounted for men with 95% and the lowest was in women with 05 %. In terms of the studied frequency of age, the highest percentage was accounted for 40-50 years with 37.4 % and the lowest was related to the age up to 50 with 11.8 %. In terms of education, the lowest was related to individuals with a master degree with a frequency of 23 (7.5%) and the highest was related to individuals with a bachelor degree with a frequency of 144 (47.3%). Descriptive statistics variables are shown in the Table 3.

For the normal distribution assumption is related to variables, Kolmogorov-Smirnov test was used. Given that the significance level is less than 0.05, assuming normal variables cannot be rejected. Accordingly the parametric tests had to be used. To investigate the hypotheses, an independent sample t-test was employed.

With regard to values, a significant level of each variable is all over 0.05. So  $H_0$  is supported by data. Therefore, we conclude that there is

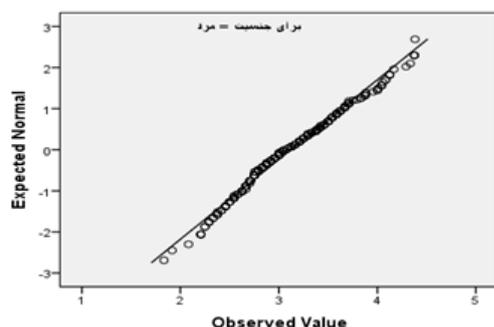


Figure 2. Normality For Men Human Resources Productivity Variable

enough evidence to accept the hypothesis H0. Accordingly; employees have enough ability, understanding, organizational support, motivation, feedback, validation and adaptation.

Furthermore, in relation to eighth hypotheses, and in response to the significant difference between men and women in terms of human resources productivity, first, the researchers examine whether the productivity of human resources between women and men follow a normal distribution. Because there is relatively large number of man, Normal Q-Q plot was used to study the normality and Shapiro test used for women.

In this graph, whenever the data is on a straight line to be saying that the data follow the normal distribution assumption. The figure above shows the normality of human resources productivity data of men. Given the significant level of 0.2, which is more than 0.05, the assumption of normality of women's human resources productivity data cannot be rejected.

However, since normality of human resources

productivity has been established for both sexes, t-test was used to compare means. Some data description indicator of the efficiency of human resources between males and females are in the table 7.

According to the table 7 and the significant level of more than 0.05, the researchers conclude that there was no significant difference between men and women in terms of statistical efficiency of human resources. To study the significant difference of human resources efficiency between different age groups, it is also be necessary to test whether the assumption of normality is restored. According to the frequency table below can be seen that people in the age groups 20-30 and over 50 age group has the frequency of 46 and 36, respectively. Therefore, a Shapiro test for normality should be used.

The normality test results for two age groups 20-30 and above 50 years can be seen in the table 9.

According to the Figure 4, with few exceptions, the normality of the data for human resources productivity in the age groups 30-40 and 40-50 years can be accepted. However, due to normality for data human resources productivity in four age groups, an ANOVA analysis can be used to compare group means.

The significance level of less than 0.05 obtained in the above table shows that there is difference between different age groups in human resources productivity. Moreover, according to the average human resources productivity in different age

Table 5  
Normality Test for the Efficiency of Gender Variable

	Shapiro-Wilk		
	Statistics	df	women's human resources productivity
women's human resources productivity	0.97	14	0.8

Table 6  
Average Equality Test for the Efficiency of Human Resources in Both Sexes

	Frequency	Percent	SD	Average human resources productivity	Average human resources productivity	p-value
Man	291	0.95	0.515	3.12	1.28	0.2*
Women	14	0.05	0.59	2.94		

Table 7  
The Average Productivity of Human Resources in Different Age Groups

Ages	Average	Percent	Frequency
3.24	3.24	0.59	0.59
3.17	3.17	0.55	0.55
3.04	3.04	0.48	0.48
3.12	3.12	0.58	0.58

categories, it can be concluded that the average human resources productivity among people ranging in age from 20-30 years is higher than others. Also, in response to this issue that people with different education are not equally productive human resources, we need to test whether the normality assumption is working or not. Data normalization of human resources productivity at two levels of diploma and MA, according to Shapiro test is shown in the table 11.

According to the table 11, we can accept the normality of human resources productivity values

with 95% confidence in two levels of diploma and MA.

According to the Figure 5, we can accept the normality of human resources productivity values in the levels of associate degree.

According to the Figure 6, we can accept the normality of human resources productivity values in the levels of bachelor degree. Since the normality is being restored, ANOVA was used for comparison of the four groups described above.

Since the value of significant is higher than 0.05, we can conclude that there is no statistically significant difference between human resources productivity of people with different educational levels.

### DISCUSSION

By moving societies toward globalization and the expansion of competition in the industrial product market, human resource efficiency more than ever has become the determining factor in

Table 8  
Normality Test of the Efficiency of Human Resources for Different Age Groups

	Ages	Shapiro-Wilk		
		df	df	p-value
Human Resource Productivity	20-30	0.99	46	0.82
	Up to 50	0.95	36	0.12

Table 9  
Analysis of Human Resources Productivity Variance in Four Age Groups

	Root squares	df	MS	F	p-value
Between group	3.2	3	0.77	73.2	0.044
Within group	65.84	301	0.28		
Total	95.86	304			

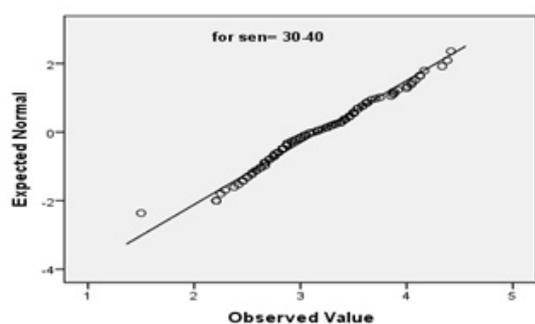


Figure 3: Normality for Human Resources Productivity Variable in the Age Range 30-40

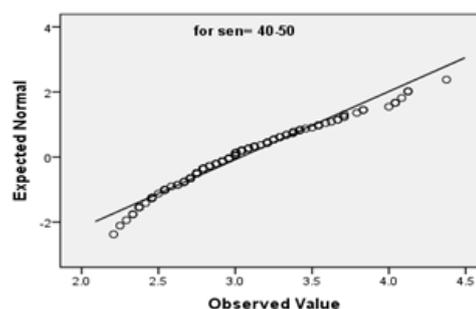


Figure 4: Normality for Human Resources Productivity Variable in the Age Range 40-50

Table 10  
Normality Test for the Variable Human Resources Productivity at the MA and Diploma Level

	Education level	Shapiro-Wilk		
		Statistics	Degrees of freedom	p-value
Human Resource Productivity	20-30	0.99	46	0.82
	Up to 50	0.95	36	0.12

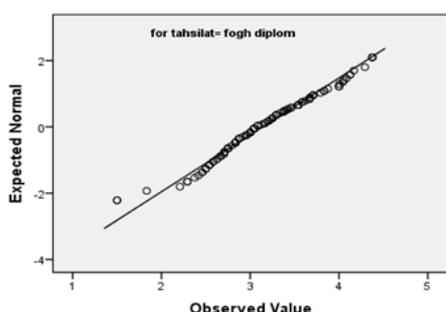


Figure 5: Normality Test for the Variable Human Resources Productivity at Associate Degree Level

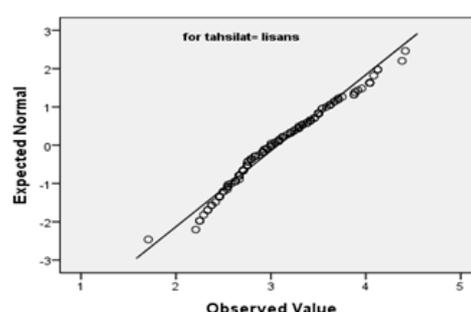


Figure 6: Normality Test for the Variable Human Resources Productivity at Bachelor Level

Table 11  
Average Human Resources Productivity In Terms of Education

	Mean	SD	SD
Diploma	3.28	27	0.48
Associate Degree	3.14	111	0.58
Bachelor	3.07	144	0.5
Master	2.97	23	0.51

Table 12  
Variance Analysis of Human Resources Productivity In Terms of Education

	Root squares	df	Average of squares	F	p-value
Between group	1.54	3	0.51	0.145	0.145
Within group	85.4	301	0.28		
Total	86.95	304			

the competitiveness of industrial products in domestic and foreign markets and thus the profitability of the industry where agricultural processing industry is no exception.

Given that rice processing, unlike other crops in the farm does not end and most research has been conducted on this product was focused on planting and harvesting and since checking the efficiency of any system is an issue that is related to all elements of the system and one of the most valuable and the most vital resource in promoting high efficiency of organizations is human resources.

We investigate that subject in this study and the results are generally as follow: after reviewing the first to seventh question using parametric statistical one-sample t-test, it is showed that, due to the significant level from one to seven questions that was 1, 0.98, 0.91, 0.47, 0.9, 0.9 and 0.99, respectively,  $H_0$  is supported by data from first to seventh hypotheses. Accordingly, employees have enough ability, understanding, organizational support, motivation, feedback, validation, and adaptation.

According to the results of parametric t-test to compare means in significant level 0.05,

there is no significant statistically difference between men and women in terms of human resources productivity. According to the results of the test Shapiro, to study the normality of individuals in age groups with few exceptions, we can say that the human resources productivity in these age groups is normally distributed. Also, the variance analysis to compare group means at the significant level 0.05 shows that productivity of human resources between age groups is different. The average productivity of human resources among people 20-23 years are more than others.

In relation to study the effect of education level on the human resources productivity according to the results of the Shapiro test and to study the normality of individuals in the age groups we can say that the human resources productivity in the education levels is normally distributed. Analysis of variance for comparing the average of the four groups (diploma, associate degree, undergraduate and graduate) at the significant level 0.05 shows that in the human resources productivity, there is no statistically significant difference between people with different educational levels. Thus, according to the results of testing hypotheses, some suggestions are offered as follows:

- To design better mechanisms on the importance of human resources and an increase in the ability of staff to provide technical, new and advanced equipment (hardware and software), organizing specialized training courses and professional exams
- To promote the development of conditions to increase the knowledge of employees' job, documentation and set of procedures for doing things, as well as more attention to adjust the job description and training
- To reinforce the staffs' belief under perceived organizational support, because the perceived support of the organization would improve employee performance
- To develop a local incentive system tailored to the needs of employees working in various fields in order to increase motivation, development and reform regulations to encourage employees, attempting to provide material facilities, providing

short-term and medium-term loans, to develop housing and consumer cooperative for staff, pay attention to families of staff in career

- To design fair performance evaluation model to improve the human resources productivity
- Efforts of managers and the relevant authorities in accordance with the rule of law in the style appropriate to the firm or organization, in proper planning work and precise and scientific control of applications as well as adopt appropriate structure
- To optimize workplace ergonomics, health and safety, improve the quality of raw materials and machinery, and equipment maintenance system

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