THE EFFICIENCY IMPROVEMENT OF HANDBAG FORM WATER HYACINTH.

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ABSTRACT

The purpose of this research was to improve the production efficiency of handbag from water Hyacinth. The target groups were 8 manufacturers of handbag from water hyacinth in Udon Thani province, Thailand. The results of the study were as follows: (1) The production efficiency in aspect of production cost was found that when the salt is used in the drying and sulfur baking processes, the cost of handbag producing increased from 31 baht to 41 baht per production cycle. As a result, the production efficiency which is considered from the relationship between inputs and outputs has decreased from 8.07 before adjustment to 6.25 after adjustment. (2) The production efficiency in aspect of the production process was found that When salt is used in the drying process, the drying time can be reduced 1 day from 5 days to 4 days. And when using salt in the sulfur baking process can reduce the time by 1 day, from 2 days to 1 day. (3) The production efficiency in aspect of the satisfaction in the work was found that manufacturers are satisfied with the development of production efficiency. Because the manufacturer can reduce the time it takes to produce by using salt that is easy to find from the area to use in the production process.

Keywords: Production Efficiency Improvement, Production Process, Manufacturers' Satisfaction, Handbag from Water Hyacinth

INTRODUCTION

Water hyacinths were imported into Thailand in the year 1901 during the reign of King Rama V, which was brought from Japan to decorate with beautiful flowers. When the water hyacinth fell along the general canal and spread quickly, 1 hyacinth was able to breed 1,000 trees in 1 month. Although the water is dry to death but its seed remaining for 15 years. Therefore water hyacinth is an water environmental problem and has become more serious at the national level. Have to spend a budget to get rid of water hyacinths. Which not only in Thailand, more than 50 countries around the world also encountered the same problem. In which Thailand has started to eliminate water hyacinths since the reign of King Rama VI [1].

Thai society is an agricultural society that produces tools and appliances from natural materials for use in living. In particular, wickerwork is a handicraft that is related to the way of life of Thai people both directly and indirectly for a long time. Traditionally, the production used raw materials and local resources combined with skills that represent cultural and artistic values. Consistent with the living conditions, terrain, as well as the natural environment can be a main work for use [2]. Wisdom has been passed down from generation to generation, inheriting identity, as well as customs, traditions, and culture of the community [3]. Which in Asia is an important source of basketry production in the world. This is because there are many plants that are suitable for making wickerwork such as rattan, sedge, bamboo, sea grass, and water hyacinth etc.

The use of water hyacinth for making wickerwork in Thailand began in Phayao Province. They bring invention as home appliances, furniture, home decor accessories, which

is popular for both Thai and foreign tourists [4]. Developed into a household industry, community business, and small and medium-sized enterprises. Water hyacinth products have community product standards (Thai Community Product Standard 39/2016) [5]. Currently, the Wicker bag or Raffia bag is not just a local community product in Southeast Asia. But there are manufacturers of clothing and accessories that have international brands has produced woven bags for sale in more than 10 brands, both European and Asian manufacturers such as Portugal, Italy, Sweden, England, Japan and Thailand etc.

Production efficiency is the process of producing the best results by planning the use of production input, production control, product delivery, as well as product development lead to consumer satisfaction which will lead to maximum profits [6]. May say that production efficiency is a matter of using or managing inputs and operational processes with the product as a regulator. Or production efficiency is the ability to maximize productivity and use the least production time. Production efficiency may show numerical performance values or the comparison between investment costs and profits received. If the profit is higher than the cost, the more effective it is, and may include the use of efficiency in design with the least resources lost from the system. [7] Improvement of production efficiency can be done in many ways such as reducing costs, reducing time, reducing waste, reducing work procedures, and increasing machine efficiency etc.

The production efficiency improvement of handbag form water hyacinth is considered from the efficiency of inputs which are production factors include of energy costs, labor costs, and raw material costs.

Productive efficiency including handicrafts that are ready to be sold and the efficiency of the outputs obtained from the satisfaction of the manufacturers as a result of improving the efficiency of the production process. With the purpose of this research were to improve the efficiency of bag production from water hyacinth.

The result of the development of handbag production efficiency from water hyacinth able to create opportunities and income such as small and medium enterprises (SMEs) and community economy. The development of international competitiveness has direct benefits to manufacturers in the small industry group and the household industry that is a large part of the country, and generate income for the community and locality. Manufacturers of other products can use the efficiency improvement guidelines to improve their production efficiency, and to increase income for handicraft manufacturers.

RESEARCH METHODOLOGY

1. The target group of the study included 8 wicker manufacturers in Ban Dung district, Udon Thani province, Thailand.

2. Research process

2.1 Select one handbag manufacturers from water hyacinths.

2.2 Understand and collaborate on data storage about production and operation, marketing, and financial of manufacturers.

2.3 Study Production information by recording workflows from interviews and observations from the process beginning (raw materials finding) till production is ready (finished product to sell).

2.4 Analyze data used for plan the production development of handbag from water hyacinths.

2.5 Report production development plan for handbag manufacturer to understand and accept and cooperate in the plan implementation, or provide suggestions and opportunities to work on production conditions.

2.6 Improving the production efficiency of handbag from water hyacinths as planned.

2.7 Study on the satisfaction the production efficiency of handbag from water hyacinths after improved.

2.8 Comparison of operating results and production efficiency before implementation and after planned operations.

RESEARCH RESULTS

Handbag manufacturers from water hyacinths used in research were a producer group with 20 members in the group. The results of the data study in aspects of production and operation, marketing, and finance found that; the production of handbags from water hyacinth 1 time of production cycle was divided into 2 steps which are (1) raw material preparation 5 steps and (2) production process 7 steps. The cost of producing bags from water hyacinth *31* baht per bag consists of sulfur powder 6 baht, varnish oil 3 baht, turpentine oil 2 baht, and cloth lining 20 baht. Produce handbag from water hyacinths for *1* bag in *2* days, the bag is 250-400 baht per piece.

Handbags form water hyacinths were sold at the source of production and contacted through electronic channels. In addition, there were distribution in product displays at various events. The production process of handbag from water hyacinths had the problems for raw material preparation in the drying process and the baking with sulfur process that takes a lot of time. Leading to the development of handbag from water hyacinths production efficiency.

The results of the production efficiency improvement of handbag from water hyacinth were as follows:

1. The production efficiency improvement of handbag from water hyacinth in aspect of production cost was found that; before improve the manufacturing process had cost of production is 31 baht consisting of sulfur powder, varnish oil, turpentine oil, and cloth lining. The production efficiency calculated by formula: Efficiency = Output / Input = 250/31 = 8.07. Improving production efficiency by using salt in the drying and sulfur baking processes, the cost of handbag producing increased from 31 baht to 41 baht per production cycle. As a result, the production efficiency decreased from 8.07 before adjustment to 6.25 after adjustment as seen in the Table 1.

Table 1. Compare of the production efficiency improvement of handbag from water hyacinth in aspect of the production cost

Raw materials	**Before improve the manufacturing process**	**After improve the manufacturing process**
Sulfur powder	6	3
Salt	0	12
Varnish oil	3	3
Turpentine oil	2	2
Cloth lining	20	20
Total	31	40
Output: Cost of handbag from water hyacinth (baht)	250	250
The production efficiency	250/31 = 8.07	250/40 = 6.25

2. The production efficiency improvement of handbag from water hyacinth in aspect of the production process was found that; when salt is used in the drying process, the drying time can be reduced 1 day from 5 days to 4 days. And when using salt in the sulfur baking process can reduce the time by 1 day, from 2 days to 1 day. Or can reduce the total time in the production process by 2 days as shown in Table 2.

Table 2. Compare of the production efficiency improvement of handbag from water hyacinth in aspect of the production process

Steps	Before improve the production process		After improve the production process	
	Activity	**Time**	**Activity**	**Time**
1. Raw material preparation	1. Water hyacinth harvest	1 day	1. Water hyacinth harvest	1 day
	2. Drying the water hyacinth by sun	5 days	2. Drying the water hyacinth by sun	4 days
	3. Baking with sulfur	2 days	3. Baking with sulfur and salt	1 day
	4. Desiccate to expel the smell	1 day	4. Desiccate to expel the smell	1 day
	5. Collected (50 water hyacinths/bundle)	1 day	5. Collected (50 water hyacinths/bundle)	1 day
Total	5 steps	10 days	5 steps	8 day
2. Production process	1. Size selection of water hyacinth	10 minutes	1. Size selection of water hyacinth	10 minutes
	2. Cut water hyacinth into small strips	1 hour	2. Cut water hyacinth into small strips	1 hour
	3. Braid the water hyacinth	3 hours	3. Braid the water hyacinth	3 hours
	4. Forming handbag	3 days	4. Forming handbag	3 days
	5. Coating with varnish oil	5 minutes	5. Coating with varnish oil	5 minutes
	6. Drying	2 hours	6. Drying	2 hours
	7. Cloth lining stitching	20 minutes	7. Cloth lining stitching	20 minutes
Total	7 steps	3 days 6 hours 25 minutes	7 steps	3 days 6 hours 25 minutes
Grand total	12 steps	13 days 6 hours 25 minutes	12 steps	11 days 6 hours 25 minutes

3. The production efficiency improvement of handbag from water hyacinth in aspect of the satisfaction in the work was found that; manufacturers were satisfied with the development of production efficiency. Because when adding salt to assist in the drying and baking with sulfur processes, even increasing the cost but takes less time. Salt is a raw material that easy to find, cheap, available for sale, and general use.

Comparison of results of the production efficiency improvement of handbag from water hyacinth shown in the Table 3.

Table 3. Compare of results of the production efficiency improvement of handbag from water hyacinth

Production efficiency	Before improve the production process	After improve the production process
Production cost aspect	Costs of production 31 Baht Production efficiency 8.07	Costs of production 40 Baht Production efficiency 6.25 (Additional cost 9 baht, Reduced efficiency 1.82)
Production process aspect	Drying the water hyacinth by sun for 5 days	Drying the water hyacinth by sun for 4 days (Time reducing 1 days)
	Baking water hyacinth with sulfur for 2 days	Baking water hyacinth with sulfur and salt for 1 day (Time reducing 1 days)
satisfaction in the work aspect		Manufacturers were satisfied with the efficiency of the production process.

Production efficiency	Before improve the production process	After improve the production process
		Enhance the efficiency of production process for raw materials preparation can reduce the time for 2 days by used the salt as the raw material that easy to find, cheap, available for sale, and general use.

CONCLUSION AND DISCUSSION

The improvement of the production efficiency of handbag from water hyacinth by increasing the cost from the adding of raw materials to help in the drying and sulfur baking processes. In which the drying process can reduce the time by 1 day and in the process of baking with the sulfur by 1 day, the raw material used is salt which has a value of 12 baht. Therefore, the reduction of the total time of 2 days causes the productivity to increase. The improvement of the production efficiency of the handbag from water hyacinth is consistent with the increase in productivity. Because the value of the raw material increase (12 baht of salt cost) is the proportion of input increasing less than the output that can be increased in a reduced time (2 days).

1. According to the research, it is found that handbags from water hyacinths had higher cost after improve. Resulting in the production efficiency from an economic point of view reduced from 8.07 to 6.25. Which the production efficiency in view of cost usually does not consider the quality, but considering the amount in the form of profits or the maximum output. Therefore efficiency in economic view is the ratio between investment and the result of an investment [8]. In case of the output is the same volume and the same price, if can reduce the cost, it can increase the production efficiency in cost dimension.

2. According to the research, the efficiency development had increased the raw materials in the production process, resulting in a 20 percent reduction in the operating time of two activities. This development of production process efficiency is to increase productivity by reducing cycle time [9], which leads to improved efficiency resulting in total satisfaction to manufacturers.

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