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A Transferring of Human Capital and Office Management Knowledge to Seaweed Farming Community

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Abstract: *Knowledge Transfer Programme (KTP) is introduced by the Ministry of Education (MOE) Malaysia to link the collaborations between the Malaysian local universities, industries and communities to continue to flourish. This paper aims to observe the achievement of the seaweed cultivation management system in Semporna, Sabah under KTP project. The project involves the transfer of knowledge related to the management from the university to the staff of industry partners and local seaweed farmers. This project introduces the knowledge in seaweed cultivation in a modern, systematic, and proper manner to the seaweed farming management. The knowledge transfer included farming and office, human capital, and financial management. After two years, the project objectives have been achieved. The seaweed farms have been better managed and organized, production and sales were increased, and staff management skills have been successfully developed.*

Keywords: Human Capital Management, Seaweed Farming Management System, Knowledge Transfer Programme (KTP)

1. Introduction

Seaweed farming is one of the main economic activities among fishers in Semporna Sabah. The extensive use of seaweed, particularly the usage of carrageenan extracted from seaweed plant as an added value used in various fields such as in the cosmetics industry, textiles, pharmaceuticals, and food proved that seaweed farming industry is indeed a very promising potential to be explored by community and farmers. The program of Seaweed farming management under the Knowledge Transfer Program (KTP) in Semporna, Sabah is a collaboration between University with seaweed industry partners. This program, which is located in the industry partner seaweed farm in Semporna, Sabah has been running for two years.

In general, this program intends to transfer knowledge of modern and systematic seaweed farming to the industry partner's staffs and Graduate Intern. The knowledge transfer also included detailed management knowledge such as office management, store management, assets management, and human capital management. Among other projects are to identify suitable varieties cultivated seaweeds and farming procedures that fit to be applied by the industry partner.

Although the period of the program is two years, within 18 months, the program objectives were achieved. This program has contributed five (5) seaweed farming plots, while the building platform and facilities available had been upgraded and improved. Apart from that, the farm has been better managed, and the harvesting period was reduced from 60 days to 40 days; harvest seaweed has increased from 500 kg to 1300 kg in one cycle, and the skills of farm workers have improved. KTP team has also developed a Standard Operating Procedure (SOP), which related to the seaweed farming method created by the project.

2. Literature Review

Seaweeds are not ordinary plants but are very treasured sea plants with multilayered uses in various industries such as pharmaceuticals agriculture, food, chemical, textile, and medicine (Roselina A. Saufi et al, 2015). *Kappaphycus* sp. also is known as Doty has been cultured for more than 40 years to provision the carrageenan industry globally (Bindu & Levine, 2011). This kind of seaweeds group can live either in a marine or brackish water location. People in oceanic countries like Philippines, India, and Madagascar have been introduced and encouraged to get cultivated in the seaweed industry. This is one of the ways to sustain a livelihood for poor people along the area (Roselina A. Saufi et al, 2014). The current study in Malaysia showed that red seaweed holds high antioxidant assets and unpolished protein content as high as 47 percent (Fisal, 2012). This disclosed the enormous potential of seaweed as a health food supplement which then implies a great potential for further expansion of the seaweed industry (Oscar Monzales, 2006).

Malaysia has produced 4,000 ton metric *Kappaphycus* sp. in dry weight annually and becomes the third major producer of this type of seaweed (Hurtado, 2007). Other countries having *Kappaphycus* sp. farming are Cambodia, Vietnam, China, Kiribati, India, Tanzania, Madagascar, and Brazil. The key factor underwrites successful *Kappaphycus* sp. agriculture in Philippines is the advancement in their farming technique since 1970s (Hurtado et al., 2008). Seaweed production in Malaysia is still left behind compared to Philippines and Indonesia. Hereafter, Malaysian seaweed industry must improve in the future to gearing towards strengthening seaweed production specially in Semporna, Sabah.

In seaweed production, the improvement must be made not only in the technique of farming but also in farm management. The systematic seaweed farming and management introduced by the universities have created a positive image for the communities (Roselina A. Saufi et al, 2015). The collaboration between the universities, industry, and community can help to spur the growth of seaweed farmers in Malaysia.

3. Methodology

The research was intended to sightsee the achievement of the seaweed farming management system in Semporna, Sabah project under KTP project year 2013 - 2016. The method applied for data collection was the observation before, during, and after the project and focus group interview (KTP team and industry partner). Nyumba et. al. (2018) clarified that the focus group is normally used as qualitative research. The program is administered jointly by the team of lecturers from the local university and industry partners. The program involves three lecturers and two graduate interns, four industry partner staffs, and few local seaweed farmers.

The main objective of this program is to transfer knowledge related to modern and systematic seaweed farming management to graduate interns and the staff of the industry partners. Specifically, the objectives of this program are to transfer knowledge of modern and systematic seaweed farming to the staff and graduate interns; to transfer knowledge of office management and human capital management to the staff and graduate interns; to help increase the industry partner seaweed production and income through modern and systematic seaweed farming and to improve and increase the soft skill of graduate interns.

The observation and focus group found that KTP team had identified several management aspects in the industry partner that need to be improved. Among other elements are office, store and asset management, human resource management, financial management and plantation, and harvesting management.

One of the common things among seaweed farmers in Semporna is the inadequate attention given in the office, store and asset management aspect. Under this program, KTP team, together with industry partner management, has introduced and developed a management system that is more systematic and user-friendly. The file system was created to keep records like employee data, financial, asset, planting, harvesting, and others. A suitable office had been built on the farm platform where all the files are classified and arranged systematically in a file cabinet. The KTP team had produce two Standard Operating Procedure (SOP) for the industry partner related to seaweed farming and three SOP related to office management (assets, store and human capital).

Human resource management involves selection, recruitment, retention, termination, development, and utilization of human capital in a proper way within an organization. Recruiting and retaining the staff were among the problems faced by most seaweed farmers in Semporna. To overcome this problem, the industry partner is advised to hire contract staff especially to perform planting and harvesting the seaweed. This effort also proves to be cost-effective. Financial management involves the process of budgeting and recording related financial data. Before the KTP project all the financial management done by the industry partner management located in the Kota Kinabalu main office. Under this project, the farm supervisor had been taught the knowledge relating to financial management especially in budgeting and recording the plantation expenses.

The staffs and graduate interns are trained in managing the planting and harvesting seaweed systematically. The training involves the process of seaweed's seed selection and purchasing, the proper sequence, and the schedule of seaweed plantation and work maintenance. The farm supervisor trained in planning the work schedule for several plots and how to optimize the existing resources. To ensure that the process of planting-harvesting can be conducted in an orderly and systematic, KTP team has formulated a method in one procedure book.

4. Discussion and Conclusion

The direct impact of the project on the industry partner can be seen from the perspective improvement of infrastructure and sales revenue. In a way to increase the efficiency and productivity of industry partners, the existing farm facilities and infrastructure must be upgraded. During the project, various changes and improvements have been made to the farm infrastructure and facilities. Before the KTP project industry partner was used a traditional planting system in planting the seaweed but after the KTP, the industry partner used to

change the traditional system to a modern planting system. The number of planting plot also increase at the same time.

The KTP project also successfully transforms the platform of bamboo that used for all seaweed jobs such as tie the seeds, drying, preparing, and cleaning up the rope to two platforms of wood. One platform used for drying work and one platform for maintenance work and tie the seeds. In terms of store and office management, the KTP project has transferred the knowledge of proper inventory and filing systems. KTP managed to create the systematic classification and record of goods and inventory for an industry partner.

Under the KTP project also, the industry partner succeeds to upgraded the seaweed drying system, from the traditional method that wet seaweed was dried on the platform floor only and the drying process takes a more extended period (about 1 week) to the modern system. The modern drying system shows that 10 pieces of 3-tier drying rack were built through the project. The 3-tier drying rack showed that more seaweed can be dried at one time and drying time can be shortened to 3-4 days.

In the aspect of the seaweed seeding process that involved the process of selecting, cutting, and tying the seed, before the KTP project the work was done on the floor. The staff squat during the process. The staff felt easily tired and suffered from backache The KTP has created the table for cutting and tying the seed. Staff will be sitting in a chair, which puts them in a more comfortable condition.

Industry partner had made two sales over two years period. The first sale was made in which a total of 929 kg of dried seaweed sold to local traders at RM 2.10 per kilogram with total sales of RM 1950.90. While the second sale at RM2.20 per kilogram. A total of 903.5 kg of dried seaweed were sold for RM1987.70. The volatility in the price of dried seaweed coupled with the intervention of middlemen is a significant issue plaguing the seaweed industry in Sabah.

The main objective of this project is to transfer knowledge to graduate interns and the industry partner. The knowledge transferred to the graduate interns can be categories into two types. There are soft skills and technical. Graduate interns were coached to improve their soft skills such as how to work in a team, lead and manage staffs, communicate with local authorities, suppliers, staffs, and buyers. In terms of technical aspects, the graduate interns were exposed to the modern and systematic seaweed farm management. The graduate interns are not only exposed to the modern and systematic method of planting and harvesting, but they also exposed to the management of farm resources effectively.

The knowledge that had been transferred to industry partners was the adoption of systematic and modern seaweed farming method from the beginning process of seed selection to the storage of dried seaweed. To ensure the new staff follows the proper procedure, KTP together with the industry partner develops a set of SOP. This SOP covers not only the process of seaweed farming but also includes the process of effective office management.

The observation and focus group with the industry partner and KTP team, highlight that several challenges faced during the project, the production of the seaweed farming project is not very encouraging and much lower than the expected result. Among the factors that have influenced the production of seaweed are human, nature, geographical and location site, and safety factors. Human is one of the common challenges faced by seaweed farmers in

Semporna is labor issues. The main issues are the difficulties in getting local labor or foreign workers who have valid identification documents. Among other issues are the lack of training, staff commitment, and high turnover ratio. Most of the local population, especially the youth, are not interested in the job due to the nature of the job, such as exposure to the hot weather, less well-equipped infrastructure, and security threats. To overcome these issues, industry partners take advantage of fishermen presence to serve as part-time labour.

The site location, which is located in an open sea is exposed to the threat of strong wind and waves, especially during the south wind. Given the remote location of the site and quite far from the other farmers and surrounding by quite extensive reef areas, invite the turtle and fish, which are a threat to seaweed. In direction to apply the modern method of the plantation, the same depth of seawater is required. Since the site is surrounding by coral reef areas, the sea depth in the area is quite varied. Therefore geographically, the appropriate space for seaweed plantation is limited. Additionally, the distance of the farm with the other farmers (seed suppliers) also influence the planting schedule. Besides that, tidal conditions also interfere with the work of transporting seed.

The result from the focus group also founds that to solve the current issues, face by the industry partners, the KTP team suggests two alternatives; stay in the existing farms and strive to overcome these challenges or look for a new place which is more suitable in term of location and geographical location. The first option will consume more time and more costly since it will involve more research and development work. While the second option is seen as more potential, although it will involve a high initial capital cost if the process of site selection is done rightly, the opportunity for success is much higher.

Seaweed industries is indeed a challenging industry in which many issues and obstacles that must be faced before the farmer reach a level that can be proud of. The challenges and solutions that have been experienced during this project can be served as a guide in the development of this industry. Therefore, the industry can contribute to the economic boost and national income. KTP project team believes that further studies in the seaweed industry are needed to improve and strengthen the industry and thus placing Malaysia as the world's leading producer of seaweed at the upstream or downstream level.

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