OPTIMIZATION OF MANPOWER

A CASE STUDY
AT KILANG GULA FELDA PERLIS SDN. BHD.

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ABSTRACT (BAHASA MALAYSIA)

Tesis ini mengemukakan satu kajian mengenai masalah pengoptimuman tenaga kerja di sektor perkilangan. Bagi tujuan ini, satu kajian kes telah dibuat di salah sebuah kilang gula terbesar di Malaysia iaitu Kilang Gula Felda Perlis Sdn. Bhd. (KGFP) Chuping, Perlis. Secara umumnya, objektif kajian ini ialah mengenal pasti bilangan tenaga kerja (pekerja tetap dan pekerja sambilan) yang optimum untuk ditempatkan di empat stesen kerja iaitu *clarification, boiling, curing* and *packing* bagi tiga shif iaitu pagi, petang dan malam. Tiga model linear telah dibentuk menggunakan pendekatan optimal, dengan mengadaptasi kajian awal yang dilakukan oleh Alfares, Topaloglu dan Ozkarahan, dengan merujuk kepada beberapa hasil kajian pengkaji yang lain.

Model-model yang dibentuk telah berjaya mengoptimumkan bilangan pekerja kilang tersebut kepada 30% hingga 36%. Model-model linear tersebut diprogram melalui LINDO. Model-model yang telah dicadangkan serta dapatan kajian yang dihasilkan merupakan idea bernas kepada pihak pengurusan kilang untuk meningkatkan produktiviti di samping menjimatkan kos. Selain daripada itu, pihak pengurusan kilang ini boleh mengubah suai model-model linear yang dihasilkan untuk menyelesaikan masalah yang serupa di bahagian-bahagian kilang yang lain.

ABSTRACT (ENGLISH)

This thesis is the result of a research on the optimization of manpower in the manufacturing sector. A case study was performed at Kilang Gula Felda Perlis Sdn. Bhd. (KGFP) Chuping, Perlis. Basically, the objective is to identify the optimal number of permanent and temporary workers that would be allocated in the clarification, boiling, curing, and packing stations for morning, afternoon and night shifts.

Three linear programming models were formulated using the optimization approach, by adapting earlier studies by Alfares, and Topaloglu and Ozkarahan, guided by other studies that are related to this research field. The findings of the models are able to improve the current allocation of workers by 30% to 36%. The computer package LINDO was used to attain the research objectives.

The proposed models and their findings may offer good thoughts for the management of KGFP to improve the practiced human resource, mainly on manning the stations. As a return value, it would contribute to a significant cost saving. Also, the management may adapt the proposed models to solve similar problems in other departments in the company.

DEDICATION

This thesis is dedicated to my beloved husband, Mohd Faizal, my adorable son Mohd Fathurrahman, and my new born daughter Mirrah Nashihin, who are continuously standing by me and supporting me. Your persistence, sacrifices and assistances had given me the strength that I needed to accomplish this thesis. Thank you for being such a wonderful and affectionate family.

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SECTION 1

INTRODUCTION

1.0 Overview

One of the important resources that an organization manages is their manpower. It would be realistic to suggest that manpower should be among the main factors to consider in developing business strategies. Lynch (1982) commented that lack of attention towards effective manpower planning would lead to over-manning, excessive labor costs and subsequent redundancies. He added that it became more crucial when the issue of manpower relates to not only quantity, but also quality. It is very clear that calculations of manpower resources cannot promise exactness in prediction. Thus, the hard decision to maintain manpower strength is left to the personnel division. However, there are many methods or applications that can be used to overcome the problem such as linear programming (Berman, et al., 1997), integer programming (Aykin, 1996), mixed integer programming (Beaumont, 1997), and mixed integer linear programming (Venkataraman and Brusco, 1996).

Linear programming models are often used to help managers make decisions. Inevitably, special attention is given to linear programming problems because they have wide practical applications in such diverse areas such as allocation of scarce

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