

**A LEAN MANAGEMENT APPROACH OF RICE SUBSIDY DISTRIBUTION: SOME FINDINGS FROM A STUDY IN SELANGOR**

Yatimah Sarjiman <sup>A</sup>, Halim Mad Lazim <sup>B</sup>, Hendrik Lamsali <sup>C</sup>



**ARTICLE INFO**

**Article history:**

**Received** 14 November 2022

**Accepted** 16 January 2023

**Keywords:**

Rice Subsidy;  
Lean Management;  
Agriculture;  
COVID-19;  
Paddy.



**ABSTRACT**

**Purpose:** The objective of this study is to look at the problems that arise related to the distribution of subsidies provided by the Government and also to examine the extent to which the principles in Lean are applied and Lean approach can be applied in the management of subsidy distribution among farmers.

**Theoretical Framework:** The Malaysian government faces issues and challenges on food insufficiency and the importance of ensuring food security in the country and paddy is a major food commodity in Malaysia and an important factor in terms of security, poverty reduction and social issues. As the number of COVID-19 cases increases in the country, there is a heated debate on the appropriate measures that should be taken by the Government to curb the surge of paddy issue.

**Methodology:** For that purpose, a survey was conducted on 10 senior government officials who manage matters related to fertilizer subsidies in the Ministry, Farmers Organization Board, Area Farmers Organization, Department of Agriculture and Subsidy Product Suppliers and 20 farmers in the area studied. by using Lean Management as the main point in this study.

**Findings:** The collected data were analyzed using ATLAS.ti and Microsoft Excel. The results of this study show that most of the officers interviewed do not really understand the Lean philosophy and many officers consider the 5S to be Lean.

**Research Implications:** An understanding of Lean is critical because the Lean approach is a sustainable way to achieve operational excellence and can be applied in many areas.

**Originality/Value:** This study analyzed the issue arised during the during the distribution of rise subsidies throguh lean management.

Doi: <https://doi.org/10.26668/businessreview/2023.v8i1.1257>

<sup>A</sup>MBA, Northrop University, Inglewood, California, USA, Lecturer, Department of Operations Management, School of Technology Management and Logistics, Universiti Utara Malaysia, Malaysia.

E-mail: [yat1601@gmail.com](mailto:yat1601@gmail.com) Orcid: <https://orcid.org/0000-0002-0604-582X>

<sup>B</sup>Ph.D, School of Management, Universiti Sains Malaysia, Pulau Pinang, Malaysia, Lecturer, Department of Operations Management, School of Technology Management and Logistics, Universiti Utara Malaysia, Malaysia. E-mail: [mlhalim@uum.edu.my](mailto:mlhalim@uum.edu.my) Orcid: <https://orcid.org/0000-0003-2938-4821>

<sup>C</sup>Ph.D, School of Business and Economics, Loughborough University, Leicestershire, UK, Lecturer, Department of Operations Management, School of Technology Management and Logistics, Universiti Utara Malaysia, Malaysia. E-mail: [hendrik@uum.edu.my](mailto:hendrik@uum.edu.my) Orcid: <https://orcid.org/0000-0002-9650-4697>

## UMA ABORDAGEM DE GERENCIAMENTO ENXUTO DA DISTRIBUIÇÃO DE SUBSÍDIOS DE ARROZ: ALGUNS RESULTADOS DE UM ESTUDO EM SELANGOR

### **RESUMO**

**Objetivo:** O objetivo deste estudo é analisar os problemas que surgem relacionados à distribuição de subsídios fornecidos pelo governo e também examinar até que ponto os princípios de Lean são aplicados e a abordagem Lean pode ser aplicada na gestão da distribuição de subsídios entre os agricultores.

**Estrutura teórica:** O governo da Malásia enfrenta questões e desafios sobre a insuficiência alimentar e a importância de garantir a segurança alimentar no país e o arroz é um importante produto alimentar na Malásia e um fator importante em termos de segurança, redução da pobreza e questões sociais. Como o número de casos COVID-19 aumenta no país, há um debate acalorado sobre as medidas apropriadas que devem ser tomadas pelo governo para frear a onda da questão do arroz.

**Metodologia:** Para esse fim, foi realizada uma pesquisa com 10 altos funcionários do governo que administram assuntos relacionados a subsídios para fertilizantes no Ministério, Conselho de Organização dos Agricultores, Organização dos Agricultores de Área, Departamento de Agricultura e Fornecedores de Produtos Subsidiários e 20 agricultores na área estudada. utilizando o Gerenciamento Lean como ponto principal deste estudo.

**Conclusões:** Os dados coletados foram analisados utilizando ATLAS.ti e Microsoft Excel. Os resultados deste estudo mostram que a maioria dos oficiais entrevistados não entende realmente a filosofia Lean e muitos oficiais consideram os 5S como sendo Lean.

**Implicações da pesquisa:** A compreensão de Lean é crítica porque a abordagem Lean é uma forma sustentável de alcançar a excelência operacional e pode ser aplicada em muitas áreas.

**Originalidade/Valor:** Este estudo analisou a questão levantada durante a distribuição de subsídios de aumento através do gerenciamento Lean.

**Palavras-chave:** Subsídio para o Arroz, Gerenciamento Lean, Agricultura, COVID-19, Paddy.

## UN ENFOQUE DE GESTIÓN AJUSTADA DE LA DISTRIBUCIÓN DE SUBVENCIONES AL ARROZ: CONCLUSIONES DE UN ESTUDIO EN SELANGOR

### **RESUMEN**

**Objetivo:** El objetivo de este estudio es analizar los problemas que surgen en relación con la distribución de las subvenciones que concede el Gobierno y también examinar en qué medida se aplican los principios de Lean y puede aplicarse el enfoque Lean en la gestión de la distribución de las subvenciones entre los agricultores.

**Marco teórico:** El Gobierno de Malasia se enfrenta a problemas y retos relacionados con la insuficiencia de alimentos y la importancia de garantizar la seguridad alimentaria en el país, y el arroz es uno de los principales productos alimenticios en Malasia y un factor importante en términos de seguridad, reducción de la pobreza y cuestiones sociales. A medida que aumenta el número de casos de COVID-19 en el país, se produce un acalorado debate sobre las medidas apropiadas que debería adoptar el Gobierno para frenar el aumento del problema del arroz.

**Metodología:** Para ello, se llevó a cabo una encuesta entre 10 altos funcionarios del Gobierno que gestionan asuntos relacionados con las subvenciones a los fertilizantes en el Ministerio, la Junta de Organización de Agricultores, la Organización de Agricultores de la Zona, el Departamento de Agricultura y los proveedores de productos subvencionados y 20 agricultores de la zona estudiada. utilizando Lean Management como punto principal en este estudio.

**Resultados:** Los datos recogidos se analizaron utilizando ATLAS.ti y Microsoft Excel. Los resultados de este estudio muestran que la mayoría de los funcionarios entrevistados no comprenden realmente la filosofía Lean y que muchos funcionarios consideran que las 5S son Lean.

**Implicaciones de la investigación:** La comprensión de Lean es fundamental porque el enfoque Lean es una forma sostenible de alcanzar la excelencia operativa y puede aplicarse en muchos ámbitos.

**Originalidad/Valor:** Este estudio analiza la problemática surgida durante la distribución de las subvenciones al alza a través del Lean Management.

**Palabras clave:** Subvención al Arroz, Lean management, Agricultura, COVID-19, Paddy.

## **INTRODUCTION**

Paddy is a major food commodity in Malaysia and is an important factor in terms of security, poverty reduction and social issues (Persidangan Padi Kebangsaan, 2017). Malaysia should take the initiative to reduce food imports despite being in a good position in 28 out of 113 countries based on the rating by the Global Food Security Index 2019. Various efforts have been implemented to increase the yield of paddy in the country. One of the Government's initiatives is to provide subsidy assistance or known as Agricultural Input Assistance. However, according to a report by Utusan Borneo Online (2019), the country's rice production, especially in 2016, 2017 and 2018, continued to decline. The study found that Malaysia imports rice from foreign countries such as Thailand, Vietnam and Pakistan which is about 30 % while the remaining 70 % of the 2.7 million metric tons of rice needs are grown domestically. The level of rice production in Malaysia has also remained the same since 1990 (Rosmal, 2019) compared to other regional countries that have shown an increase. News from Awani Astro also reported that the Malaysian paddy industry has not changed much and is still in the same situation since the 70s and 80s (Johari, 2018).

The Malaysian government is faced with issues and challenges regarding the inadequacy of food supply and the importance of ensuring food security in the country. These concerns have long been felt and even action has been taken since the beginning where the Government has implemented various policies. The First National Agricultural Policy began in 1984, followed by the Second National Agricultural Policy in 1992 and then the Third National Agricultural Policy in 1998. Coupled with the COVID-19 pandemic situation that occurred since 2019, this food insufficiency crisis had an impact big to the Malaysian economy.

This study intended to explore the understanding of lean philosophy among government officers who were directly involved in the fertilizer subsidy distribution among farmers in the Selangor area. This study objectives were set in order to find out the problems that arise related to the distribution of subsidies provided by the Government and also to examine the extent to which the principles in Lean are applied and Lean approach can be applied in the management of subsidy distribution among farmers. The main agenda for lean philosophy are to avoid waste and create values to customers. More importantly, lean philosophy also has proven potential for continuous improvement. This became the main direction for this study that enables government agencies to maximize the values created and reduce waste accordingly.

As the number of COVID-19 cases increases in the country, there is a heated debate on the appropriate measures that should be taken by the Government to curb the surge of COVID-19 cases. As a result, the Government has been stuck between a rock and a difficult place. The

exchange between life and livelihood; between health and the economy; and between security restrictions and freedom of movement. The government has walked on a very tight rope. Whatever decision is made by the Government, it will definitely result in some parties being dissatisfied. The government is working to control the epidemic, and stabilize the economic situation as soon as possible. The need for economic, social and political reform is to put our country in a stronger position is essential in building a prosperous, just, united and resilient Malaysia.

The Government has allocated RM4.9 billion to the Ministry of Agriculture and Food Industry in the 2020 Budget (MAFI). The funds will be used to improve the country's food security and food quality. Malaysia needs to produce 3.94 million tonnes of paddy by 2020 to achieve 100% self-sufficiency. That requires increasing average paddy production from 5.72 tonnes/ha (2020) to 6.94 tonnes/ha (2024). The Paddy and Rice Industry Division of the Ministry of Agriculture and Food Industry ensures the sufficiency of basic food supplies (BIPB). The BIPB plans and coordinates the industry's growth and manages the paddy and rice supply chain. BIPB's goals include achieving at least 75% self-sufficiency in rice production and ensuring inexpensive quality rice.

In general, a total of 52 recent research articles from 2017 to 2021 in various scholarly journals on the implementation of the Lean approach, however there are no studies that investigate the use of lean in agriculture. The Lean approach can be applied in various sectors and not just the manufacturing sector. According to Fletcher (2018), the use of Lean approach in the public sector can improve organizational processes, result in cost savings, enhance organizational culture and improve the quality of goods and services. The Lean approach has also been used for centuries in manufacturing since its introduction by the Toyota company in 1965 (Dickson et al., 2009).

In Malaysian context, there are gaps regarding Lean management and are still limited (Bakar, Mat, Fahmi & Urus, 2017), particularly in the agricultural sector. Although the issue of subsidy distribution is often discussed in the paddy farming industry (Kiandee, 2021), but those methods of overcoming the issue of subsidies are seen as unhelpful (Utusan Borneo Online, 2019). Lean approach in the agricultural sector in Malaysia has not been clarified yet because there is not much reference that can be done on the method of implementation and effectiveness, while abroad have shown many benefits of the application of lean approach, especially in the rice farming industry (Perdana et al., 2019).

Therefore, the researcher chose to study the use of Lean approach in the distribution of subsidies is due to the frequent issues related to the provision of subsidies to farmers (Ibrahim,

2019). Among the issues that have been discussed in various platforms are such as the issue of fertilizer subsidy not received, distribution of rice seeds, use of illegal pesticides, low rice yield and so on (Abu Bakar, 2019; Harun & Ariff, 2017). These issues may be overcome if the Lean approach is implemented comprehensively based on the philosophy, principles and techniques of the implementation of the approach.

Moreover, issues of the need and delay of distribution of subsidized fertilizers and pesticides have also long been discussed (Hashim et al., 2017; Muazu et al., 2015). Farmers also claim that paddy production is expected to decline if the delay in subsidized fertilizer is given by the authorities (Kata Malaysia, 2019). The Ministry of Finance Malaysia has also asked the Ministry of Agriculture Malaysia to immediately resolve the issue of the need and distribution of paddy seeds and subsidized fertilizers to launch the work of farmers in the relevant states (Aziz & Rosli, 2019).

Accordingly, this study needs to be conducted to see to what extent the Lean approach is adopted in the agricultural sector. More specifically, this study will look at the application of the Lean approach in the distribution of subsidies in the paddy farming industry. Berita Nasional Malaysia (BERNAMA) on 2 December 2019 also reported on the issue of late payment to suppliers and delivery of fertilizer in the subsidy distribution scheme to farmers. Jabatan Audit Negara Malaysia (2018) has also reported a leakage in the implementation of incentives and subsidies to the target group involving weak internal controls in the registration of farmers. According to the Auditor General's Report, the management of the scheme was not implemented prudently or efficiently and was ineffective. Among the main factors that cause ineffective management of the scheme is from the aspect of delay in fertilizer distribution.

Furthermore, according to statistics in the period 2016 to 2018, paddy production decreased by up to 8.5% with the average paddy productivity not reaching the set target of 5 tonnes and only able to reach 3.7 tonnes per hectare that year. In addition, a total of 7.95 million metric tonnes was produced far from the target of 8.43 million metric tonnes for total paddy production (Laporan Audit Negara Malaysia, 2018). Moreover, according to Lee and Baharuddin (2018) although farmers get large subsidies from the Government it does not seem to help farmers to increase productivity. According to Alam et al. (2011) the average age of paddy farmers in Malaysia is 46 years and above and they face challenges in using new technologies and management methods which ultimately result in difficulties in maintaining productivity. Following this introduction, the second part of this paper presents a review of the literature while the third part deals with methodology. The fourth section sets out the results and discussions while the last section discusses the conclusions and implications.

## LITERATURE REVIEW

This section provides reviews on studies on Lean implementation and studies on subsidy implementation at the global and glocal levels.

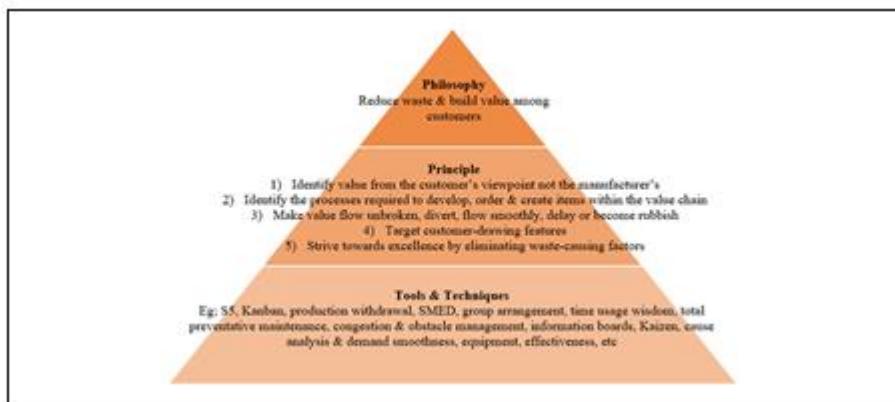
## IMPLEMENTATION OF LEAN APPROACH IN DISTRIBUTING AGRICULTURAL INPUT ASSISTANCE TO FARMERS

The Lean approach is a very practical improvement effort that helps improve process efficiency in the workplace to be more productive and efficient through the implementation of work styles that can reduce waste (Malaysian Productivity Corporation, 2016). Lean management style is an approach to managing an organization that supports the concept of continuous improvement and is an effort to improve a product, service or process that requires additional improvement over time to improve efficiency and quality (Universiti Putra Malaysia, 2021).

According to Saari (2016), Lean refers to a principle or method that focuses on identifying and eliminating activities that do not add value to customers in any process of a job. According to Kakouris et al. (2021) meanwhile, Lean thinking is an approach aimed at improving processes and customer satisfaction, while reducing costs for continuous improvement. The Lean Production Approach was pioneered by the Toyota giant and is stated in a book produced by James Womack entitled "The Machine That Changed the World" (Womack et al., 1990). The author has given a comprehensive description of the whole lean system. The authors have also documented in depth the lean advantages of the mass production model pioneered by General Motors and predicted that lean production would eventually succeed.

The book is the first book that is responsible for highlighting the Japanese manufacturing method compared to the traditional Western manufacturing system, namely the "mass production system". The book has also emphasized that the method emphasized by the Japanese is superior to the Western system. Lean Management style was actually "born" in Japan in 1940 for the Toyota Automobile System or better known as the Toyota Production System (TPS). Taiichi Ohno with the help of Dr. Sheigo Shingo was the person responsible for developing the TPS system. The application of the Lean approach involves an understanding of three important aspects, namely the Philosophy of the Lean approach, the Principles of the Lean approach and the Tools and Techniques used in the implementation of the Lean approach.

FIGURE 1. Philosophy, Principles, Tools, and Techniques in Lean Approach



Source: Arlbjørn and Freytag (2013)

## LEAN IMPLEMENTATION IN VARIOUS SECTORS AT GLOBAL AND GLOCAL LEVELS

The concept of lean management was first introduced in the vehicle production industry, particularly for Toyota production systems (Womack et al., 1990). Several other well-known companies also use Lean including Intel, John Deere and Nike (Womack & Jones, 1997).

This concept has also been implemented in improving the work environment, well-being and health of employees (Dieste et al., 2019; Toivanen & Landsbergis, 2013). In the agricultural industry, lean management has begun to take place. In the United States, for example, farmers use a lean approach especially in identifying better tools to reduce waste and are efficient in managing profits (Hartman, 2015). In the United Kingdom, especially in relation to the meat value chain, the same concept is used and more focused on efficiency and productivity (Taylor, 2006). In Italy, Value Flow Mapping is used to increase efficiency as well as productivity (Colgan et al., 2013).

This approach based on Toyota's production system is still used by the company and continues to grow in other companies and sectors. This is because the concepts introduced are appropriately applied to achieve the goals of an organization. Lean manufacturing is a practice that can be done by organizations from various fields. Highlights of the study will provide a deeper understanding of Lean implementation in various fields and sectors. Various studies have been conducted in looking at various aspects of lean implementation and adaptation at the international level.

Rodrigues et al. (2020) studied the impact of lean and green practises on logistics performance in northern Portugal. This study's major goals are to assess a set of organisations' degree of implementation of lean and green initiatives, and to assess the link between the two. This research examines the link between lean and green practises and long-term profitability

using structural equation modelling (SEM). This study is a case study employing a questionnaire. Each organisation was asked to score the practice's adoption on a Likert scale. The research assessed 102 firms that volunteered to participate in the survey. The questionnaire was designed and filled out using Google Docs. The sample included micro-companies (32.4%), small businesses (25.5%), medium-sized businesses (16.7%) and big businesses (250+ workers) (more than 250 employees, 25.5%). The findings suggest that lean and green techniques are not sufficiently addressed and codified in Portuguese firms. Statistical research also revealed a link between lean environmental practises and green activities. Lean and green have been shown to improve a company's logistical procedures. This research collects data quantitatively using a questionnaire. The primary component of the questionnaire covers nine lean traits and eight questions linked to practise.

This research contributes to academic and companies. There are many benefits towards sustainability when combining lean practices and green practices. Second, the development of structural models for lean practices and green practices has been put forward. This model provides a better understanding of these practices, which can encourage companies to develop strategic initiatives toward continuous improvement. The developed model offers a conceptual contribution to the logistics, sustainability, lean and green arenas.

This study is to support lean implementation through integration with green practices. The new model was successfully developed and made a conceptual contribution to the field under study. From the aspect of writing, the abstract of the study report does not describe the whole study. Overall, this study is a very comprehensive study and the findings presented with graphic support greatly help the reader's understanding. Researchers have also recommended that the impact of lean practices on supply chain performance, such as supplier management strategies and customer relationship strategies be implemented in future studies.

## **LEAN MANAGEMENT IN VARIOUS SECTORS IN MALAYSIA**

Although originally the Lean philosophy, principles and methods were designed for the manufacturing sector, but in recent times this approach has begun to be adopted consistently in the services and administration sectors. Lean management principles and methods have been adapted and their potential has been developed in various fields not just enterprise industries across the healthcare sector, information technology (Kadarova & Demecko, 2016). The latest studies that have been carried out are as follows;

TABLE 1. A Study on Lean Management in Various Sectors in Malaysia

Aspects of the Study	Researcher/Year
<b>Operational performance of the organization/company</b>	Zanu, Hamizan and Mohd Asaad, Mohd Norhasni ,2017; Beah Zi Yuan, 2015
<b>Manufacturing company performance</b>	Mohd Norhasni Asaad, Rosman Iteng, Raziah Saad, 2020; Ahmad Nur Aizat Ahmad, Nur Syamimi Ahmad, Md Fauzi Ahmad, 2021
<b>Saving operating time in the furniture manufacturing industry</b>	Ahmad Nur Aizat Ahmad, Nur Shahirah Hanapiyah dan Md Fauzi Ahmad, 2021
<b>Knowledge transfer in personnel management</b>	Mohd Norhasni Mohd Asaad, Noraini Nordin & Fadhilah Mohd Zahari, 2018; Nur Siti Fatimah, Osman, 2019
<b>Account management system</b>	Kamisah Ismail, Che Ruhana Isa, Lokman Mia, 2018
<b>In -service training: Classroom management</b>	Foziana Jamaludin, Mohamed Yusoff Mohd Nor Mohd Izham Mohd Hamzah, 2018;
<b>Inventory management and financial practices</b>	Buyong, Ahmad Nur Aizat Ahmad, 2020; Muhammad Arif bin Zulkifli, 2021; Nor Rifhan Hashim, 2017
<b>Disaster management</b>	Haliza Abdul Rahman, 2018
<b>Auto industry</b>	Mad Ithnin Salleh, Wan Salmuni Wan Mustaffa, Nursyazwani Mohd Fuzi, Suzaituladwini Hashim, Nurul Fadly Habidin, 2019
<b>Marketing in the food industry</b>	Maryam Hamid Yaseen, Rozilah Kasim, Falah Saleem Falih Mohammed Ihsan Ahmed Sabah, 2020
<b>Practice management relationships and operational performance</b>	Noor Aslinda Abu Seman, Zawin Nadjah Mohamad Hatta, Nor Kamariah Kamaruddi, Faizal Yamimi Mustaffa, Nurazwa Ahmad, 2020
<b>Lean reform management among employees</b>	Siti Raba'ah Hamzah, Dalina Kamarudin, 2019
<b>The relationship of Lean implementation with employee reduction in the industry</b>	Amelia Natasya Abdul Wahab, Muriati Mukhtar, Riza Sulaiman, Kamarudin Shafinah, Mei Choo Ang, Ruzzakiah Jenal, 2017
<b>Application of industry lean management</b>	Mohammed Elhaj Alsoofi Mohammed Ahmed dan Leong Sing Wong, 2020; Abdul Razak Ibrahim, Haffar Imtiaz, Bahaudin Mujtaba, Zafar U. Ahmed, 2020
<b>Supply chain management in the manufacturing industry</b>	Taofeeq Durojaye Moshood, Gusman Nawanir, Fatimah Mahmud, W.A. Ajibike 2021; Muazziss Najmi, Hazura Mohamed, Muriati Mukhtar, 2018
<b>Waste management</b>	B Gladysz, A Buczacki, C Haskins - Resources, 2020
<b>Kaizen</b>	Mohd Sadiq Mohd Mokhtar, 2018
<b>The impact of lean management in the industry</b>	Mohammad Iranmanesh, Suhaiza Zailani, Sungkyup Sean Hyun, Mohd Helmi Ali, Kwangyong Kim, 2018; Yahya M S, Mohammad M, Omar B, Ramly E F, 2019
<b>Lean architecture</b>	Aryani Ahmad Latiffi, Muhd Nur Suhairul Sulum, Kamalludin Bilal, 2020
<b>Automotive management</b>	Touhidul Islam, Shahryar Sorooshian, Shariman Mustafa, 2018; M Z M Ismail, A H Zainal N I Kasim, M A F M Mukhtar, 2018
<b>Health care/lean hospital /pharmacy</b>	Anuar, Azyyati, Saad, Rohaizah, Yusoff, Rushami Zien, 2018; Salim Ahmed, Noor Hazilah Abd Manaf, Rafikul Islam, 2018
<b>Supply chain</b>	Cheng Ling Tan, Sook Fern Yeo, Chea Huat Low, 2018; Ahmed Zainul Abideen, Fazeeda Mohamad, 2020
<b>Security management</b>	Pang Kar Kei, 2019; Mahadi Hasan Miraz, Mohamad Ghozali Hasan, Kamal Imran Sharif, 2018
<b>Lean transformation in education</b>	Gusman Nawanir, Mohammed Binaliahhajj, Kong Teong Lim, Kong Teong Lim, Mohd Hanafiah Ahmad, 2019

<b>Implementation issues and constraints</b>	Phun Xesh Ling, 2020; Adnan Bakri, M.F.M. Alkbir, Nuha Awang, Fatihhi Januddi, M.A. Ismail, 2021
<b>Definitions, concepts, terminology, frameworks and models</b>	Mohamed S. Bajjou, Anas Chafi, Abdelali Ennadi, 2019; Azim Azuan Osman, Abdul Aziz Othman, Mohd Kamarul Irwan Abdul Rahim, 2019

## DIGITAL AGRICULTURE AND THE LEAN APPROACH

Medennikov and Raikov (2020) studied digital agriculture production in Russia. Because in today's world, agricultural information based on data gathering, formalisation, and analysis is required to foresee the use of digital technology in agricultural economic sectors at the federal and regional levels. The national agriculture strategy objectives are used to assess the status towards the creation of this national platform. To accomplish the country's agricultural growth objectives, over 10 massive information systems must be unified. A list of agricultural digitization challenges has also been implemented.

The methodology of this study uses a special convergence strategy to formulate the conditions that ensure the purpose and continuous concentration of the process of creating the site or platform. Research on the implementation of digital farming in Bulgaria, Denmark, the United Kingdom, Ireland and the United States has been made for the purpose of preparing the Russian digital farming platform. A total of 50 requirements were identified and formulated to create digital sub-platforms and services from the national digital agriculture platform. Matters related to the approach of using quality functions and Kanban are also emphasized. It also used cognitive modeling and reverse problem-solving methods to consider changes in importance as a roadmap for digital sub-platforms and services over time. This study is very contributing in the implementation of digital agriculture.

## COMPARATIVE STUDY OF LEAN APPROACH

The Swedish National Department of Agriculture funds a leadership program called Practice Leader (LP). The European Social Fund has funded a leadership program called Lean Lantbruk or Lean Agriculture (LA). Both of these programs use advisors or trainees who have been trained in leadership construction (Boyatzis et al., 2006). The program goes through two process steps namely (i) advisors are trained in coaching skills; (ii) advisors train farmers on program elements. This study compares findings from two national education programs for entrepreneurs in the Swedish agricultural sector namely Leadership Practices (LP) and Lean Agriculture (LA). This study uses qualitative and quantitative approaches in the collection and analysis of data from 54 semi -structured interviews and from a survey with 109 participants.

The findings of the study indicate that the main challenges of business and personal development are time pressures and the need for better communication. Leadership program participants emphasized the effects of internal barriers such as fixed thinking. Lean program participants emphasize the impact of external barriers such as funding. Both groups placed more emphasis on personal and business growth than the control group. The results of the study also indicate that entrepreneurial education programs can help participants, program developers, and advisory organizations identify and manage business challenges and barriers. In addition, this study contributes to the literature on education for entrepreneurs in the agricultural sector by examining the reflections of agricultural entrepreneurs on barriers and challenges in business development and its relevance to overcoming barriers focused on perspectives based on various types of resources.

## STUDY ON AGRICULTURAL SUBSIDIES

This study on agricultural subsidies is important in looking at government policies and subsidy scenarios for paddy cultivation globally. With this study, the issue of global subsidies and proposals to address this issue can be identified and used as a reference.

### *A Study of Global Agricultural Policy*

Various studies on agricultural subsidies have been undertaken, particularly on government subsidies and incentives in industrialised, developing, and third world nations. These studies are vital to understanding government policy, which is the backbone of agricultural development. Understanding government policies, particularly incentives and subsidies, is critical since they link to the country's agriculture sector's failure. As a matter of fact, government policy may identify, reproduce, and apply methods for implementing successful or excellent practises, in addition to identifying and improving deficiencies, errors, and mistakes. Reports from studies will also assist other researchers gather information about the topic investigated and narrow the study's emphasis (Kim, 2018).

A meta-analysis research examined global government subsidies and incentives (Minviel & Latruffe, 2017). Econlit, Web of Science, Web of Knowledge, Storage Journal (JSTOR), Econpapers, Science Direct, RepEc (IDEAS) and Google Scholar were used to gather empirical data. This meta-analysis utilised 195 observations from 68 research performed between 1986 and 2014. The research found that subsidies are frequently linked with worse agricultural technical efficiency. The meta-regression findings show that the observed impact is sensitive on how subsidies are represented. The analysis found that although agricultural

The research questions that have been decided such as 1) Does the supplier meet the element of specify value in providing services at the right time to farmers? 2) To what extent is the value stream identified in the provision of rice subsidies to farmers? 3) How do suppliers

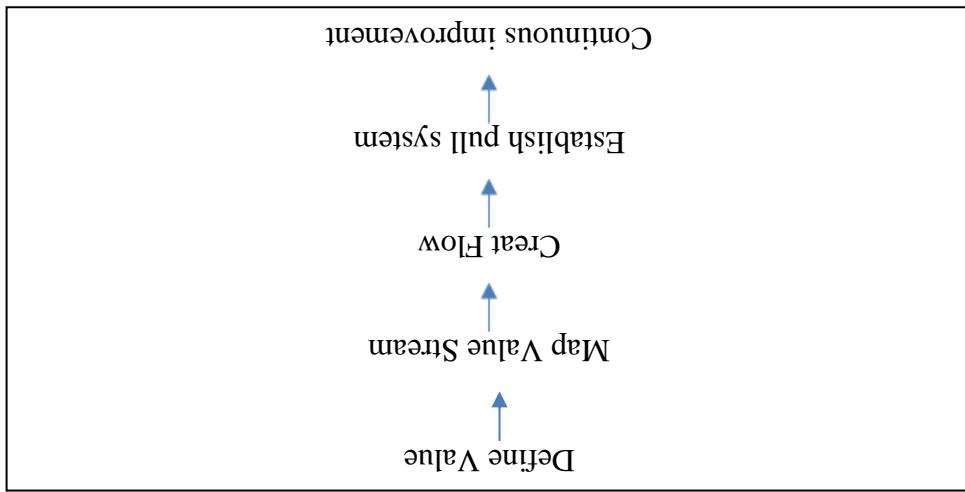


FIGURE 2. Lean Principles (Source: Womack & Jones, 1997)

The success of the management of an organization or industry is greatly influenced by the management aspects of the organization or industry. Management is the act of uniting people to achieve the desired goals and objectives using available resources efficiently and effectively. Whereas the main function of management is to make people work together to achieve the goals and objectives of the organization (Shafter et al., 2016). In this study, the researcher will look at the use of Lean approach in terms of subsidy distribution management or Agricultural Input Assistance to farmers. The framework used is based on the Lean concept principal framework that by Womack dan Jones (1997). This principle consists of 5 things that must be present in Lean, which are Identify Value, Map to Value Stream, Create Value, Establish Pull and Seek Perfection. Under each of these principles the extent to which Lean implementation is implemented and met can be identified using the tools and techniques set out in the Lean approach as outlined by Albjörn dan Freytag (2013).

## CONCEPTUAL FRAMEWORK OF LEAN IMPLEMENTATION PRINCIPLES

subsidies have a negative overall influence on farm technical efficiency, the effect is nil or negligible for 46% of the outcomes. The research concludes that the allocation of public subsidies on farm efficiency is a crucial problem in agricultural policy analysis globally. This study gives a meta-analysis of empirical findings on the subject of public subsidy distribution based on a thorough literature survey.

create a smooth management (create flow) in delivering services and products to farmers? 4) How do suppliers establish pull to farmers? and 5) Is there an element of seeking perfection in the process of distributing paddy subsidies to farmers were also constructed based on the conceptual framework of the Lean Principles above.

## **THE IMPACT OF THE COVID19 PANDEMIC ON THE AGRICULTURAL SECTOR**

Over the course of two decades, there have been two fertilizer price surges. The first instance occurred in 2008, when prices rose as a result of high local and worldwide demand for fertilizers, along with limited fertilizer supplies. The global financial crisis that occurred at the same time had a substantial influence on commodities prices as well. The price of Brent crude oil hit \$ 133.87 per barrel in July 2008, while the price of natural gas climbed to \$ 15.93 per million British thermal units (mmbtu) in October 2008. In 2021, most fertilizer prices grew dramatically in the third quarter and continued to rise in November 2021, with real fertilizer prices peaking at far higher levels than they had been during the preceding boom (DOSM, 2022). In 2021, increasing natural gas prices will be a major driver of fertilizer costs, as the cost of nitrogen production will increase dramatically as a result of the higher cost of natural gas. There was also a strong demand for agricultural goods, which resulted in farmers using more fertilizer to increase their yields, putting pressure on the price of fertilizer. High fertilizer costs may put a strain on farmers' finances, particularly in the case of crops that need a lot of fertilizers, such as maize and corn. Food costs may also be subjected to inflationary pressures, raising concerns about food security as availability to food becomes more difficult as a result of the COVID-19 pandemic and environmental issues (DOSM, 2022).

### ***Fertiliser In Malaysia's Situation***

Farmers in Malaysia's agricultural industry, in particular, make extensive use of fertilisers in order to harvest their crops. Malaysia is significantly reliant on imported fertilisers from neighbouring nations such as China, the United States, Indonesia, Canada, and Russia to meet its agricultural needs. Malaysia's overall import value for nitrogen, phosphate, and potassium was RM4.3 billion in 2021, according to the World Bank. China was the main importer of nitrogen in Malaysia, accounting for 54.2 percent of total import value for nitrogen, while Egypt and Canada were the leading importers of phosphate and potassium, accordingly, in Malaysia (DOSM, 2022). Recently, the problem of increasing fertiliser costs in Malaysia has been a major source of worry. It has the potential to drive up the price of fresh food, particularly palm oil, which is Malaysia's principal export commodity. Reduced supply from producers'

nations, increases in raw material costs such as crude oil and natural gas, which resulted in increased transportation costs, and fluctuations in foreign currency rates are only a few of the causes that have contributed to the rise in fertiliser prices. Farmers and producers were forced to endure a heavier cost burden as a consequence, which resulted in an increase in production costs and a reduction in farmers' revenue. Consumption of goods and fresh produce, on either hand, will increase even more in price for consumers (DOSM, 2022).

However, most fertiliser prices are expected to rise in 2022 as a result of lower global supplies caused by a variety of causes, including decreasing supplies from leading exporter nations, particularly China and Russia, which may create disruptions in the supply chains. It was also advised that fertiliser companies in Russia temporarily suspend their shipments as a result of Russia's invasion of the Ukraine. Raw materials costs may thus continue to rise, increasing the cost of fertiliser production and sending goods, particularly food into a downward spiral (DOSM, 2022). Accordingly, this research discovered that using Lean Management in the management of fertiliser distribution may help to decrease waste caused by increased fertiliser costs in terms of the COVID-19 outbreak that impacted Malaysia.

## METHODOLOGY

The objective of this study is to look at the problems that arise in connection with the distribution of subsidies provided by the Government. This study is also to examine the extent to which the principles in Lean management are applied in the management of subsidy distribution among farmers. To answer this objective, a qualitative study that uses the interview been used because this study is exploratory and still immature (Arnold, 2007; Duff, 2004).

The survey questionnaire distributed was divided into two sets of interview questions namely set A for officers who manage the distribution of paddy subsidies and set B for farmers. Apart from the interview questions, observations and official documents were also examined for the purpose of data collection.

The sample of this study consists of 30 ( $N = 30$ ) consisting of 10 senior government officials who manage matters related to fertilizer subsidies in the Ministry of Agriculture and Food Industry, Farmers Organization Board, Area Farmers Organization, Department of Agriculture, Malaysian Agricultural Research and Development Institute and National Farmers Organization (NAFAS) and 20 farmers in the study area.

The collected data were analyzed using ATLAS.ti for qualitative analysis and Microsoft Excel for descriptive analysis.

## RESULTS

### Main theme data, second theme data, third theme data and raw data

A total of three main theme data, 14 second theme data, 30 third theme data as well as 1483 raw data related to Lean implementation were identified in this study. The main theme data consists of Lean Philosophy, Lean Principles and Lean Tools / Techniques. The main Theme Data are Lean Philosophy, Lean Principles and Lean Tools /Techniques. The second Theme Data is Identify Value, Map to Value Stream, Create Value, Establish Pull and Seek Perfection, Jidoko (Punctuality), Heijunka (Equality), Uniformity, 5S, Poka Yoke, TPM and SMED. The third theme data is 30 and is a breakdown of the second theme data. The raw data is the entire keyword information obtained from interviews with respondents related to the implementation of lean and the distribution of subsidies involving officials and farmers. A summary of the total data obtained from this study as per the table below.

TABLE 2. Main Theme Data, Second Theme Data, Third Theme Data and Raw Data of Lean Implementation in the distribution of Paddy Subsidy in Selangor

Key Theme Data	Second Theme Data	Third Theme Data	Raw data and %
Falsafah Lean	Concept	Definition	24 3.0%
		Importance	24
Lean Principles	Value	Determination of Requirements	51 16.2%
		Farmer Signals	74
		Determination Process	132
	Value Flow	Planning	24 12.4%
		Avoid Waste	172
	Continuous Flow	Efficiency	104 14.4%
		Overcome Obstacles	125
	Attraction	Punctuality/Product	46 4.4%
		Use of Visual Boards	24
	Improvement	Challenges	163 18.7%
		Way of work	134
Lean Tools /Techniques	Jidoko (Punctual)	Inaccurate Distribution Time	50 6.3%
		Not Exactly Subsidized Products	50
	Heijunka (Equal)	Busyness	24 6.5%
		Complaints	80
	Uniform	Same Distribution Time	50 6.3%
		Subsidized Products Received Uniformly	50
	5S	5S	10 2.0%
		EKSA	22
	Poka Yoke	SOP	16 2.3%
		Monitoring	20
TPM	TPM	Level of Efficiency	24 5.2%
		Empowerment of maintenance	30
		Optimum Cost	14
		Complaint Reduction	12
	SMED (36)	Flexible	18 2.1%
		Repair Ability	7
		Cost Increment	8
Total:	3	14	30
			1582
			100

(Source: Interview with respondents)

Findings from this interview are based on the informations stated by the respondents about the informations highlighted by the researcher. Not all informations are said to lead to Lean implementation instead the researcher needs to separate the statements made according to the themes that have been identified. Researchers also need to separate the results of interviews that are in Lean, the results of interviews that lead to Lean or lead to non -lean management/conventional management.

The results from the interviews showed that the third most common data themes were related to the fifth Lean Principal theme, namely Continuous Improvements (18.7%), Value (16.2%) and Continuous Flow (14.4%). From the percentage of this theme has roughly shown a trend where the improvement of the value is very important and the establish cocontinuous flow of the value should be given attention.

In the Lean Principle, Continuous Improvement is the fifth or final principle after Value detection is implemented, Value Flow is established, ensures Continuous Value Flow and strengthens Attraction. Efforts to implement these principles are a good start, but the step or implementation of the fifth principle of Continuous Improvement is probably among the most important in Lean and improving the process is part of the process that can help success in the implementation of corporate culture. It should be noted that Lean is not a static on the other hand requires constant effort and vigilance to perfect. Every employee should be involved in implementing lean. In fact, according to Lean experts, continuous lean implementation is only really considered lean after going through the value flow mapping process at least several times (Crawford, 2016).

Value Determination also obtains a high percentage of raw data because the effort to trace the key points referred to as Value (in the context of this study is quantity of subsidies and the timing of subsidy distribution) opens up a lot of space for discussion. The findings of the study show that in determining the Value involves 3 important aspects namely (i) the setting of needs (ii) the signal of farmers and (iii) the process of deciding or determination. This Value Setting is a key factor in the Lean principle. To better understand the first principle in defining customer value, it is important to understand what Value is. In the context of farmers, Value is like fertilizer, poison seeds and so on where it is important to increase paddy productivity so that farmers income will increases. The presence of the goods must be in line with a certain time. Sometimes farmers may not know what they want or may not be able to express it. This is common when it comes to new products or technologies. It is the responsibility of those who look after the interests of the farmers to help track the needs of the farmers. There are various ways that can be done to track these needs such as conducting interviews, surveys, demographic

information and web analytics or complaints that are signals from farmers (Do, 2017). As the country's resources are limited, several things need to be implemented such as making choices and determining the selected values based on the government's priorities and capabilities.

In the Lean principle, goods or services identified as Values need to go through the process of creating a flow that drives them. The flow created should move smoothly without obstruction. Continuous flow, align and balance production to meet demand, on time, without excessive inventory, maintain a high level of quality and service (Profozich, 2020). This is what is expected by customers, namely farmers in the process of distributing rice subsidies.

Value Flow which is the second principle got the fourth highest response (12.4%) and Attraction which is the fourth principle got the lowest response (12.4%). This is because farmers are not involved in creating Value Streams and Attractions. The creation of Value Streams and strengthening attraction is the effort of the agency rather than the customers and farmers. As such, the farmers did not give much response to the matter.

## CONCLUSION

The findings of the study showed that as many as 15% of the officers interviewed did not really understand the Lean philosophy. In addition, only 85% of the officers were able to respond about Lean without mentioning the principles and tools/Techniques of Lean. Nearly 80% of officials consider 5S to be Lean. An understanding of Lean is critical because the Lean approach is a sustainable way to achieve operational excellence and can be used in many areas.

There are various aspects in the implementation of Lean that need to be considered to ensure success in the various forms of Lean practice. Letcumanan, Gholami, Mohd Yusof, Ngadiman, Salameg, Streimikieni and Cavallaro (2022) study on the factors that enable the implementation of six sigma green Lean in industry in Malaysia through liturgy highlights. The methodological approach implemented includes two steps. First, through a systematic review of the literature review on the topic, which is relatively limited in the current context. The second step requires analysis of key component factors using varimax rotation to conclude the study findings.

The Scopus database was used as a search engine and 106 articles were retrieved. Data were analyzed using exploratory factor analysis (EFA) to measure the identified variables and to reveal the basic structure between the measured variables. The results show that there are 10 main things that need to be considered to ensure the success of Lean in the organization. These are (i) the readiness of the organization to implement Lean, (ii) Lean implementation methods (iii) top management commitment (iv) work environment and culture (v) project management

and selection (vi) effective scheduling (vii) availability funds (viii) fast and skilled resources (ix) training and development and (x) staff development and empowerment as well as teamwork. The findings of the above study clearly show the factors that influence the success in the implementation of Lean practice.

In the context of public management in Malaysia, the implementation of Lean needs to be strengthened to see more effective results. The suggestion of adopting the Lean concept in the government sector is a rather difficult idea, given that government has traditionally been seen as a guardian to the bureaucracy, which is a complex form of management covering many aspects, and elusive and diverse rules. This is because government agencies have various 'processes' that issue 'products or services including regulations, memo guides, reports, grants, workshops, inspections, travel permits, employee benefits processes, mail delivery and so on. All these processes have workflows that need to be improved through a lean approach and will provide useful added value to government agencies and clients.

As a result, this research discovered that using Lean Management in the management of fertiliser distribution may help to decrease waste caused by increased fertiliser costs and also lead to an increase in farmers' income.

This study has implications from both practical and financial aspects. The practical implications are implementation of Lean Practice in KPIM, Lean Practical implementation in agencies involved in the distribution of rice subsidies and building the readiness of agencies involved in lean management aspects.

In conclusion, Lean practices in a planned manner need to be implemented to increase efficiency in the distribution of paddy subsidies among farmers. The implementation of Lean Practices must be applied at every level of the implementing agency, from the Ministry to the subordinate agencies in the management of the distribution. in fact, every officer and staff should also be given training or courses on the implementation of effective Lean practices.

The implications from financial aspects where to enable the successful distribution of paddy subsidies, management transformation using Toyota's Lean Management technique is required. Not an overhaul of current structures and procedures, but a planned, organised strategy that involves all workers and follows the organization's financial model. Sizing, reduction of value-added jobs, simplifying complicated procedures, combining comparable work processes, or automating work that may be done better by ICT are some of the aims. All of this must be supported by a structure and culture that encourages creative and competitive finance.

### **Improving Paddy Subsidy Management**

Based on current developments, PKPA No. 8 of 1991 Guidelines on Manual of Working Procedures and Table Files (My Portfolio) have been reviewed and improved. PKPA Bil. 4 of 2018 myPortfolio: The Public Sector Work Guide was issued as a new approach in the implementation of duties and responsibilities in a more comprehensive and orderly manner in Government agencies. Indirectly, the work management of government employees, including those involved in the management of paddy subsidies in Malaysia in general and in Selangor in particular, can be improved. In addition, various continuous improvement approaches have been proposed by KPIM and brought to the higher authorities for review and approval to be implemented.

### **ACKNOWLEDGEMENT**

We would like to thank to all of the people who help in contributing in different ways in this project.

### **REFERENCES**

Abu Bakar, A. (2019, June 12). Bukan salah pesawah, ada faktor lain jejas hasil padi rendah, kata NGO. *Free Malaysia Today*. <https://www.freemalaysiatoday.com/category/bahasa/2019/06/12/bukan-salah-pesawah-ada-faktor-lain-jejas-hasil-padi-rendah-kata-ngo/>

Ahmad, A. N. A., Ahmad, N. S., & Ahmad, M. F. (2021). Pelaksanaan Teknik Penyeimbangan Baris Pengeluaran dalam Amalan Lean di IKS. *Research in Management of Technology and Business*, 2(1), 628–639. <https://penerbit.uthm.edu.my/periodicals/index.php/rmtb/article/view/1977>

Alam, M. M., Toriman, M. E. bin, Siwar, C., Molla, R. I., & Talib, B. (2011). The Impacts of Agricultural Supports for Climate Change Adaptation: Farm Level Assessment Study on Paddy Farmers. *American Journal of Environmental Sciences*, 7(2), 178–182. <https://doi.org/10.3844/AJESSP.2011.178.182>

Arlbjørn, J. S., & Freytag, P. V. (2013). Evidence of lean: A review of international peer-reviewed journal articles. *European Business Review*.

Arnold, A.-M. (2007). A situational analysis of national information policy, with special reference to South Africa. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 69(11-A), 4164. <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc6&NEWS=N&AN=2009-99090-368>

Bakar, N. A. A., Mat, T. Z. T., Fahmi, F. M., & Urus, S. T. (2017). Lean Management Practices

and Its Effect on Malaysian Local Goverment Performance. *Asia-Pacific Management Accounting Journal*, 12(2).

Boyatzis, R. E., Smith, M. L., & Blaize, N. (2006). Developing sustainable leaders through coaching and compassion. *Academy of Management Learning and Education*, 5(1), 8–24. <https://doi.org/10.5465/AMLE.2006.20388381>

Colgan, C., Adam, G., & Topolansky, F. (2013). Why try Lean? A Northumbrian Farm case study. *International Journal of Agricultural Management*, 2(3), 170. <https://doi.org/10.5836/ijam/2013-03-06>

Dickson, E. W., Singh, S., Cheung, D. S., Wyatt, C. C., & Nugent, A. S. (2009). Application of Lean Manufacturing Techniques in the Emergency Department. *Journal of Emergency Medicine*, 37(2), 177–182. <https://doi.org/10.1016/J.JEMERMED.2007.11.108>

Dieste, M., Panizzolo, R., Garza-Reyes, J. A., & Anosike, A. (2019). The relationship between lean and environmental performance: Practices and measures. *Journal of Cleaner Production*, 224, 120–131. <https://doi.org/10.1016/J.JCLEPRO.2019.03.243>

DOSM. (2022). *HOW FERTILISER PRICE WAS AFFECTED BY THE GLOBAL SITUATION*. Malaysia: Department of Statistics Malaysia (DOSM). Retrieved from [https://www.dosm.gov.my/v1\\_/](https://www.dosm.gov.my/v1_/)

Duff, A. S. (2004). The Past, Present, and Future of Information Policy. *Http://Dx.Doi.Org/10.1080/1369118042000208906*, 7(1), 69–87. <https://doi.org/10.1080/1369118042000208906>

Fletcher, J. (2018). Opportunities for Lean Six Sigma in public sector municipalities. *International Journal of Lean Six Sigma*, 9(2), 256–267. <https://doi.org/10.1108/IJLSS-07-2017-0086>

Hartman, B. (2015). *The lean farm: How to minimize waste, increase efficiency, and maximize value and profits with less work*. <https://books.google.com/books?hl=en&lr=&id=pUGACgAAQBAJ&oi=fnd&pg=PR11&dq=hartman+2015+lean&ots=MvLyxD2tDD&sig=IfQaMOzW5B2JAhngWIOLwuGtyUQ>

Harun, R., & Ariff, E. E. E. (2017, March 2). *The Role of Institutional Support in Malaysia's Paddy and Rice Industry* . FFTC Agricultural Policy Platform . <https://ap.fftc.org.tw/article/1164>

Hashim, M. M., Yusop, M. K., Othman, R., & Samsuri, A. W. (2017). Field evaluation of newly-developed controlled release fertilizer on rice production and nitrogen uptake. *Sains Malaysiana*, 46(6), 925–932. <https://doi.org/10.17576/JSM-2017-4606-12>

Ibrahim, A. Z. (2019, January 30). *Usaha pastikan padi negara berdaya saing*. Berita Harian. <https://www.bharian.com.my/rencana/komentar/2019/01/525655/usaha-pastikan-padi-negara-berdaya-saing>

Johari, A. K. S. (2018, May 1). *Ke mana hala tuju industri padi pasca PRU14?* / Astro Awani. Astro Awani. <https://www.astroawani.com/berita-malaysia/ke-mana-hala-tuju-industri-padi-pasca-pru14-174251>

Kadarova, J., & Demecko, M. (2016). New Approaches in Lean Management. *Procedia Economics and Finance*, 39, 11–16. [https://doi.org/10.1016/S2212-5671\(16\)30234-9](https://doi.org/10.1016/S2212-5671(16)30234-9)

Kakouris, A., Sfakianaki, E., & Tsiofis, M. (2021). Lean thinking in lean times for education. *Annals of Operations Research*, 1–41. <https://doi.org/10.1007/S10479-021-04055-7/TABLES/8>

Kata Malaysia. (2019, November 18). *Nasib si penuai padi* . Kata Malaysia. <https://katamalaysia.my/people/nasib-si-penuai-padi/>

Kiandee, R. (2021, April 23). Isu benih padi selesai masa terdekat . *Utusan Malaysia*. <https://www.utusan.com.my/berita/2021/04/isu-benih-padi-selesai-masa-terdekat/>

Kim, Y. S. (2018, January 11). *The Importance of Literature Review in Research Writing* . [https://owlcation.com/humanities/literature\\_review](https://owlcation.com/humanities/literature_review)

Laporan Audit Negara Malaysia. (2018). Aktiviti Kementerian/Jabatan Kerajaan Persekutuan dan Badan-badan Berkanun Persekutuan. *Laporan Ketua Audit Negara*, 2, 1–511.

Lee, W. C., & Baharuddin, A. H. (2018). Impacts of Climate Change on Agriculture in Malaysia. *The Impact of Climate Change on Our Life: The Questions of Sustainability*, 179–195. [https://doi.org/10.1007/978-981-10-7748-7\\_10](https://doi.org/10.1007/978-981-10-7748-7_10)

Malaysian Productivity Corporation. (2016). *Pengenalan Kepada Pengurusan Lean*. <https://www.mpc.gov.my/events/pengenalan-kepada-pengurusan-lean/>

Medennikov, V. I., & Raikov, A. N. (2020). *Creating the requirements to the national platform "Digital Agriculture*. [http://ceur-ws.org/Vol-2763/CPT2020\\_paper\\_p-1.pdf](http://ceur-ws.org/Vol-2763/CPT2020_paper_p-1.pdf)

Minviel, J. J., & Latruffe, L. (2017). Effect of public subsidies on farm technical efficiency: a meta-analysis of empirical results. *Applied Economics*, 49(2), 213–226. <https://doi.org/10.1080/00036846.2016.1194963>

Muazu, A., Yahya, I., Ishak, W. I. W., & Khairunniza-Bejo, S. (2015). Energy audit for sustainable wetland paddy cultivation in Malaysia. *Energy*, 87, 182–191. <https://doi.org/10.1016/J.ENERGY.2015.04.066>

Perdana, T., Sadeli, A. H., Hermiatin, F. R., & Ginanjar, T. (2019). Lean management in the rice industry; case study at Widasari, Indramayu district. *IOP Conference Series: Earth and Environmental Science*, 335(1), 012024. <https://doi.org/10.1088/1755-1315/335/1/012024>

Persidangan Padi Kebangsaan. (2017). *Persidangan Padi Kebangsaan*.

Rodrigues, H. S., Alves, W., & Silva, Â. (2020). The impact of lean and green practices on logistics performance: a structural equation modelling. *Production*, 30, 1–14. <https://doi.org/10.1590/0103-6513.20190072>

Rosmal, K. (2019, April 2). *Bekalan Beras Malaysia Diimport Daripada Luar Negara*. <https://kapital.my/2019/04/30-40-bekalan-beras-malaysia-diimport->

Saari, S. (2016). *Lean Management*. 1–31

Seman, N., Nadjah, Z., Kamaruddin, N., Mustaffa, F., & Ahmad, N. (2020). *The Relationship between Lean Management Practices and Operational Performance in Service Sector*. 63, 1879–1890.

Shafter, M. E., Ghnaem, S. S., & Abdelmotleb, F. A. (2016). The Roles of Management to Increase Efficiency for Employees and Interconnected with Good Leadership. *IOSR Journal of Business and Management (IOSR-JBM)*, 18(11), 8–14. <https://doi.org/10.9790/487X-1811010814>

Taylor, D. H. (2006). Strategic considerations in the development of lean agri-food supply chains: A case study of the UK pork sector. *Supply Chain Management*, 11(3), 271–280. <https://doi.org/10.1108/13598540610662185>

Toivanen, S., & Landsbergis, P. (2013). *Lean och arbetstagarnas hälsa*. Liber.

Universiti Putra Malaysia. (2021). *Apakah Maksud Lean?* [https://upm.edu.my/berita/apakah\\_maksud\\_lean-20779](https://upm.edu.my/berita/apakah_maksud_lean-20779)

Utusan Borneo Online. (2019, December 2). *Laporan Audit: Pengurusan Skim Subsidi dan Insentif Pesawahan tidak dilaksana dengan berhemat*. <https://www.utusanborneo.com.my/2019/12/02/laporan-audit-pengurusan-skim-subsidi-dan-insentif-pesawahan-tidak-dilaksana-dengan>

Womack, J. P., & Jones, D. T. (1997). Lean Thinking—Banish Waste and Create Wealth in your Corporation. *Journal of the Operational Research Society*, 48(11), 1148–1148. <https://doi.org/10.1038/SJ.JORS.2600967>

Womack, J. P., Jones, D. T., & Roos, D. (1990, April 9). *The Machine That Changed the World*. Free Press. <https://www.lean.org/Bookstore/ProductDetails.cfm?SelectedProductId=160>.