

LEGISLATION TO FOSTER AND SUPPORT THE INSECT INDUSTRY: SOMETHING FOR MALAYSIA TO PONDER

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ABSTRACT

Insect as food and feed has become a global topic of interest as an alternative to protein source. Prediction of food scarcity in the future has also bringing the subject on its importance. Many countries have developed the insect industry yet the legal framework concerning it is still at infancy stage and even uncertain. In Malaysia, as of today, the legislation on insect is scattered with no specific legislation. In this regards the existing Malaysia's legislations only cater for the danger of certain insect such as the Destruction of Disease-Bearing Insects Act 1975 [*Act 154*]. We explores the need for a structured legislation to foster and support the insect industry in Malaysia. The methodoly used was by exploring the South Korean Act on Fosterage and Support of the Insect Industry as suggestions for Malaysia to consider. Result suggests that Malaysia should have a legislation of its own to regulate the insect industry. The future of insect as food and feed holds a huge potential which Malaysia should not missed out.

Keywords: Legislation; Insect Industry; Malaysia; South Korea; Act on Fosterage and Support of the Insect Industry

ABSTRAK

Serangga sebagai makanan manusia dan haiwan menjadi topik global yang penting sebagai alternatif kepada sumber protein. Ramalan bahawa akan berlaku kekurangan makanan pada masa hadapan juga membuatkan topik ini menjadi penting. Banyak negara telah membangunkan industri serangga tetapi kerangka perundangan yang berkaitan dengannya masih di peringkat awal dan tidak jelas. Pada hari ini tiada undang-undang serangga yang khusus yang berkuatkuasa di Malaysia. Dalam konteks ini, undang-undang Malaysia sedia ada hanya berkisar kepada pemusnahan serangga bahaya tertentu, contohnya, Akta Pemusnahan Serangga Pembawa Penyakit 1975 [Akta 154]. Kertas ini meneroka keperluan undang-undang yang lebih menjurus, untuk memupuk dan menyokong industri serangga di Malaysia. Metodologi yang digunakan ialah dengan mengkaji akta dari Korea Selatan iaitu *Act on Fosterage and Support of the Insect Industry* sebagai cadangan untuk dipertimbangkan Malaysia. Kertas ini mencadangkan supaya Malaysia mempunyai undang-undang yang teratur

untuk mengawal selia industri serangga. Masa depan serangga sebagai makanan manusia dan haiwan mempunyai potensi yang sungguh besar yang Malaysia tidak boleh ketinggalan.

Kata kunci: Perundangan; Industri Serangga; Malaysia; Korea Selatan; Akta Untuk Memakmur dan Menyokong Industri Serangga (Korea)

INTRODUCTION

Insect is generally labelled as a pest and often regarded as an annoying and creepy little creature. Thus, an insect is typically associated with negativity, filthy and disease bearing. On the other side of the coin, insect as food and feed has become a global topic of interest as an alternative to protein source. Prediction of food scarcity in the future has also bringing the subject to its importance. According to the Food and Agricultural Organization of the United Nations (FAO 2018), the number of undernourished people in the world has been on the rise since 2014, reaching an estimated 821 million in 2017 – around one person out of every nine in the world. Undernourishment and severe food insecurity appear to be increasing in almost all sub regions of Africa, as well as in South America, whereas the undernourishment situation is stable in most regions of Asia (FAO 2018). Further, FAO (2018) observed that in 2017, almost 124 million people across 51 countries and territories faced “crisis” levels of acute food insecurity or worse, requiring immediate emergency action to safeguard their lives and preserve their livelihoods.

Under the food chain circle, insect plays an important role particularly for farming and the livestock industry. Edible insects can be used as a feed source for animals (Song et al. 2018). FAO has proposed the promotion of insects as a viable option to feed both humans and animals (Arnold Van Huis et al. 2013). This is because edible insects provide significant nutritional benefits (*e.g.* protein, vitamins, and amino acids), reduce the environmental footprint stemming from food production (*e.g.* reduction of greenhouse gas emission), and provide more sustainable economic opportunities, thus reducing worldwide poverty (Arnold Van Huis et al. 2013).

The insect agriculture industry has grown tremendously thus creating jobs, starting businesses, and fuelling economic growth. According to Song et al. (2018), the insect industry is a promising agricultural resource and expected to grow steadily in Korea. As interest in edible insect increases, rearing techniques and nutritious food sources are needed for mass production (Song et al. 2018). Rachel Han et al. (2017) provides an overview of the edible insect industry in South Korea and present suggestions for future pricing and promotion strategies. In the last few years, dozens of edible insect start-ups have popped up in western countries to supply a new wave of interest in bugs as food (Massimo Reverberi, 2017). This market is now in need of regulation, promotion and support.

In addition to insects as food and feed, insects are important providers of ecosystem services, formed part of traditional medicine healing properties for thousands of years, use as natural colour for food, producing the expensive silk fabric as well as for crime scene investigation for the ascertainment on the time of death (Suzana & Bashah 2018).

According to FAO, at least 527 different insects are eaten across 36 countries in Africa, 29 countries in Asia and 23 in the Americas (FAO 2008). Insects have an attractive nutritional profile with a protein content varying between 35 and 61 per cent and a balanced amino acidic profile, meeting the requirements of the World Health Organization (WHO) for

amino acids (FAO 2008). Many edible insects provide satisfactorily with energy and protein, meet amino acid requirements for humans and rich in several micronutrients (Rumpold & Schlüter 2013).

Thus, insects can contribute to food security as part of solutions to protein shortages as food and feed. The production of insect biomass as feedstock for animals and fish can be combined with the biodegradation of manure and the composting and sanitizing of waste (Arnold Van Huis et al. 2013). Furthermore, the huge prospect that the insect industry holds is irrefutable. According to Meticulous Research (2018) which is a market data research provider that the global edible insects market will increase to reach USD 1,181.6 million by 2023 and geographically, Asia Pacific region commanded the largest share in global edible insects market due to the presence of diversity of insects and huge production, positive attitude towards the insect as food and feed, and no regulatory barrier to use insect as food and feed which contributed vastly to this effect (Meticulous Research 2018). However, even when the global edible market for insects is expanding fast but it is not fast enough due to the non-standardized regulatory framework across the globe, lack of awareness, psychological and ethical barriers, and allergies due to insect's consumption being the main factors restraining the growth of insect market to some extent (Reuters News 2018). Arnold Van Huis et al. (2013) agreed that regulatory frameworks need to be developed.

Arnold Van Huis et al. (2013) opined that the production, trade and use of edible insects as food and feed touch on a wide range of regulatory areas, from product quality assurance to the environmental impact of insect farming. Thus, in order for expansion, some regulatory framework is required. As such, the objective of this paper to explore the South Korean Act with suggestions for Malaysia to foster and promote the insect industry.

This paper will cite some of the main enacted laws in Malaysia. It is acknowledged of the long list of legislations with insects related provisions in Malaysia, which this paper will not deal with but only on few as reference. We suggested that a further research should be made to peruse and study all the insect related legislations in Malaysia, for a clearer picture to suggest for a proper law to foster and promote the insect industry.

METHODOLOGY

The methodology used was a socio-legal analysis with reference to legal journals and statutes. Systematic search using the keyword "insect" was conducted on two reliable online sources namely FAOLEX and PNMB-LawNet. FAOLEX is a comprehensive and up-to-date computerized legislative database that constitutes one of the world's largest electronic collections of national laws and regulations on food, agriculture and renewable natural resources. PNMB-LawNet is the Malaysian official national printer portal, www.lawnet.com.my, a website of Percetakan Nasional Malaysia Berhad (PNMB).

The purpose of the systematic search was to find the number of legislations related to insect by using the keyword "insect". The search using FAOLEX resulted in the South Korean Act on Fostering and Support of the Insect Industry (the South Korean Act) to be on top of its list.

A search conducted on the database of FAOLEX using the keyword "insect" generated about 17,513 references to laws dealing with insect-related issues, mainly concerning sanitation

and pest control in the agricultural sector. The search using FAOLEX generated about 219 references on the keyword “insect Malaysia”.

A search was also conducted on the Malaysia official portal PNMB-LawNet, an online library of Malaysian laws that contains updated authoritative text of the Laws of Malaysia. The search on the word “insect” resulted of only one Act which used the word “insect” in its title, that is the Destruction of Disease-Bearing Insects Act 1975 (Act 154). The preamble of the Act states that it is an Act to provide for the destruction and control of disease-bearing insects and for the medical examination and treatment of persons suffering from insect-borne diseases and for matters connected therewith.

Further, a search on the PNMB-LawNet using the keyword “animal” resulted in two Acts namely the Animals Act 1953 (Revised - 2006) (Act 647) and the Animal Welfare Act 2015 (Act 772). The preamble of Act 674 provides that it is an Act to amend and consolidate the laws for preventing the introduction into, and the spreading within, Peninsular Malaysia of diseases of animals; for the control of the movement of animals into, within and from Peninsular Malaysia; for the control of the slaughter of animals; for the prevention of cruelty to animals; for measures pertaining to the general welfare, conservation and improvement of animals in Peninsular Malaysia; and for purposes connected therewith. The Act however, does not include insect. Act 772 provides for the establishment of the Animal Welfare Board, to set out the functions of the Board, to promote the welfare and responsible ownership of animals, and for related matters. The Act defines “animal” to mean any living creature other than a human being and includes any beast, bird, aquatic animals, reptile or insect but does not include wildlife under the Wildlife Conservation Act 2010 [Act 716].

A search on the keyword “pest” resulted on the Pesticides Act 1974 (Act 149) which is to control pesticides. Section 2 of the Act defines "pest" to include insects or any other plant or animal that adversely affects or attacks animals, plants, fruits or property.

Based on the above systematic search, it is opined that the term ‘insect’ is generally associated in its negative context as pest and disease bearing. It is also observed that many countries have legislations that refer mainly to insects for prevention of disease and pests control while in Malaysia, there is no legislation to specifically cater for the insect industry *per se*.

Interestingly, it is the existence of the Feed Act 2009 in Malaysia as the law governing the use of insects as food or feed ingredients. The Feed Act 2009 is an Act to establish the Feed Board, to regulate feed quality by controlling the importation, manufacture, sale and use of feed and feed additive, to ensure that feed satisfies nutritional requirement of animals, is not harmful to animals and is not contaminated so that animals and animal products are safe for human consumption and other usage, and for other matters incidental thereto.

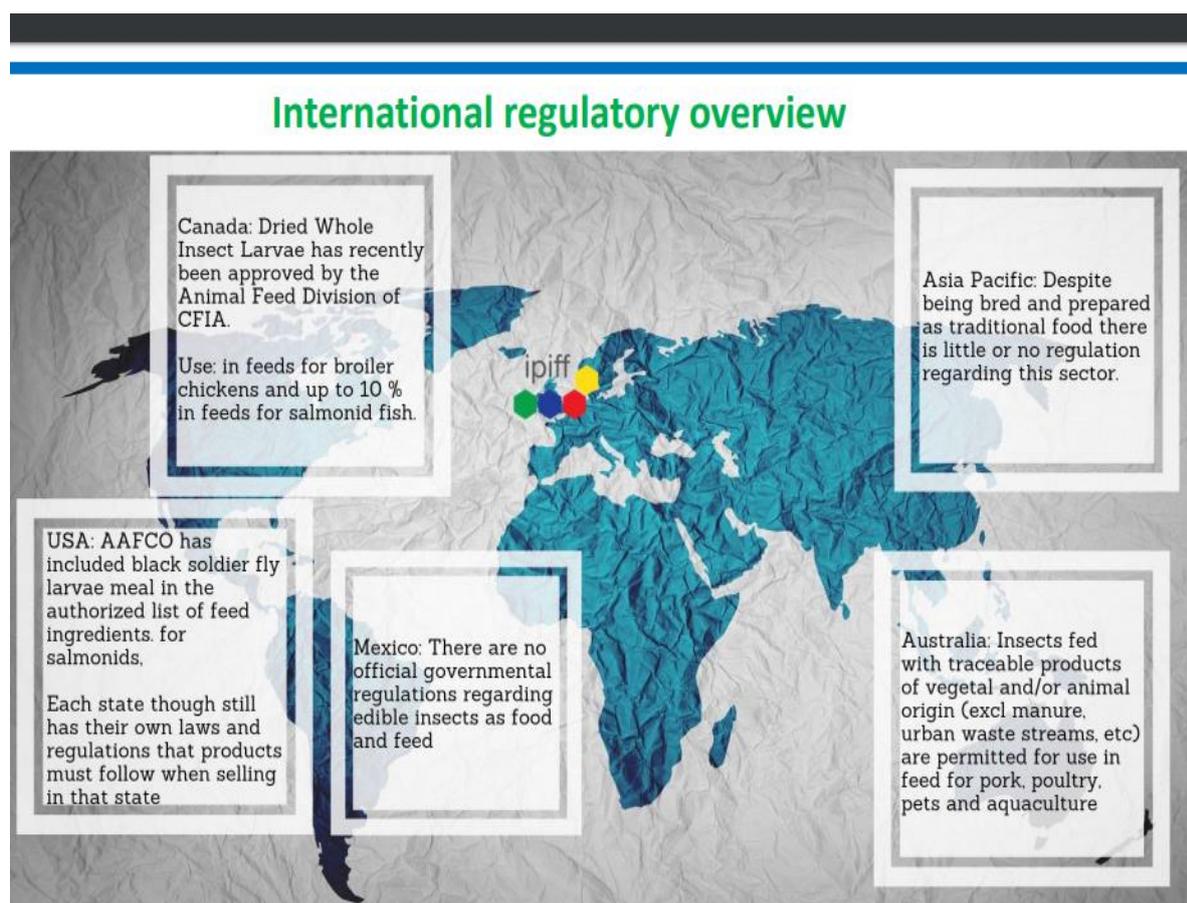
Based on the FAOLEX search result, reference is made to the South Korean Act. This paper explores the South Korean Act and its legal provisions suggesting for Malaysia to consider as an enhancement to the insect industry and its potential in Malaysia.

DISCUSSIONS AND SUGGESTIONS

Legal Framework

A major barrier to the growth of the edible insect sector, particularly in developed countries, is the lack of precise and insect-inclusive legislation, standards, labelling and other regulatory instruments governing the production, use and trade of insects in the food and feed chains (Halloran & Münke 2014). According to Halloran et al. (2015), “Insects have only recently entered into the sustainable food dialogue, but have not yet been incorporated into policy documents and have been largely omitted from regulatory frameworks.”.

Many countries have developed the insect industry yet the legal framework is still at its infancy stage and vague. The regulatory system on the use of insects as feed differs between countries worldwide as each country drafted its laws according to its policy, culture and moral values. In Malaysia, as of to date, the legislation on insect is scattered with no specific legislation. In this regards the existing legislations in Malaysia typically cater for the danger of certain insect such as the Destruction of Disease-Bearing Insects Act 1975 [Act 154] which intended to provide for the destruction and control of disease-bearing insects. According to Tham Ah Seng (2001), referring to Act 154, legislation serves as a strong deterrent to mosquito breeding by careless and indifferent householders. The overview of the international regulatory is appended below:



Source: Introduction to insect farming: Legislation and Regulation Christophe Derrien, IPIFF, IPIFF Workshop ‘Insect Farming in Scotland’, Edinburgh, 7 February 2019 (<https://www.zerowastescotland.org.uk/sites/default/files/4%20Christophe%20Derrien%20IPIFF.pdf>)

Malaysia

The Policy

Malaysia has implemented its National Policy on Biological Diversity 2016-2025 (Policy) as a guide for biodiversity management emphasizing the need for continued conservation, sustainable utilisation and the sharing of benefits from biodiversity in a fair and equitable manner. This Policy complements Malaysia's obligation under the United Nations Convention on Biological Diversity and the Sustainable Development Goals. The Policy is to strengthen agricultural planning and improve practices and develop and implement appropriate agriculture landscape planning to ensure that agricultural activities are compatible with long-term conservation of biodiversity and minimise human-wildlife conflicts and to provide extension services and technical support to smallholders and farmers to help them improve their productivity and conserve biodiversity. There are five goals supported by 17 national diversity targets accompanied by sets of actions to spell out the steps to be taken to achieve the targets and ultimately the goals. Malaysia in its bio-diversity policy listed various concerns and strategies. Among its concerns are fish stock being under pressure for pollution and unsustainable fishing practices under Goal 2 on 'reduced direct and indirect pressures' on biodiversity which target 3.4 promotes sustainable consumption and production. However, it was observed that the insect industry has not been significantly elaborated in the Policy which should be of importance, bearing in mind the future of food resources as feed for livestock including fishes.

The Law

The legislations listed below are insect related in Malaysia. The list is not exhaustive.

Name of the Act	Preamble of the Act	Notes
Destruction of Disease-Bearing Insects Act 1975	This Act provides for the destruction of disease-bearing insects. It defines the powers of the Director General and of the Medical Officer of Health which include: enter and examine premises; seize any article which may harbour disease-bearing insects; direct or take measures to destroy disease-bearing insects; and carry out medical examinations to persons suspected of being infected with insect-borne disease.	<p><u>Section 2</u> references to "disease-bearing insects" and "insect-borne disease" in those provisions shall be construed as to include such animal and its eggs, if any, and disease borne by it respectively.</p> <p><u>Section 14</u> Prohibition on breeding, etc., of disease-bearing insects without permission.</p>
Prevention and Control of Infectious Diseases Act 1988	An Act to amend and consolidate the law relating to the prevention and control of infectious diseases and to provide for other matters connected therewith.	<p><u>Section 2</u> "noxious insect" means any arthropod carrying or causing or capable of carrying or causing any infectious disease, and includes the eggs, larvae and pupae of such arthropod.</p>

		<p><u>Section 18(d)</u> provision for the closure of premises found harbouring disease-bearing insects, is used to supplement the Destruction of Disease-Bearing Insects Act.</p>
Feed Act 2009	An Act to establish the Feed Board, to regulate feed quality by controlling the importation, manufacture, sale and use of feed and feed additive, to ensure that feed satisfies nutritional requirement of animals, is not harmful to animals and is not contaminated so that animals and animal products are safe for human consumption and other usage, and for other matters incidental thereto.	<p><u>Section 2</u> defines “feed” to mean any single or multiple material whether processed, semi-processed or raw, which is intended to be fed to animals.</p>
Pesticides Act 1974 (Amended 2004)	An Act to control pesticides.	<p>The Act consists of the control of importation and manufacture of pesticides by registration and permit control of manufacture, sale and storage of pesticides by licensing control of presence of pesticides in food, death and injury occasioned by pesticides.</p> <p><u>Section 2</u> "pest" includes bacteria, virus, fungi, weeds, insects, rodents, birds, or any other plant or animal that adversely affects or attacks animals, plants, fruits or property.</p>
Animal Welfare Act 2015	This Act is enacted to make provisions to be applied to Peninsular Malaysia and the Federal Territory of Labuan with a view to promoting the	<p><u>Section 2</u> “animal” means any living creature other than a human being and includes any beast, bird, aquatic animals, reptile</p>

	welfare and responsible ownership of animals. It provides for the establishment of the Animal Welfare Board.	or insect but does not include wildlife under the Wildlife Conservation Act 2010 [Act 716].
Food Act 1983	This is an Act to provide for the protection of the public against health hazards and fraud in the preparation, sale and use of food.	<p><u>Section 2</u> "animal" includes any quadruped or bird either domesticated or otherwise, fish, reptile or insect; whole or part of which are used for human consumption.</p> <p>"food" includes every article manufactured, sold or represented for use as food or drink for human consumption or which enters into or is used in the composition, preparation, preservation, of any food or drink and includes confectionery, chewing substances and any ingredient of such food, drink, confectionery or chewing substance.</p>
Plant Quarantine Act 1976	An Act to amend and consolidate the laws relating to the control, prevention and eradication of agricultural pests, noxious plants and plant diseases and to extend co-operation in the control of the movement of pests in international trade and for matters connected therewith.	<p>Section 3 of Act A599 Agricultural Pests and Noxious Plants (Amendment) Act 1984 provides for amendment of the Act name to the Plant Quarantine Act 1976.</p> <p><u>Section 2</u> "beneficial organism" means any invertebrate animal (including the eggs of such animal), fungus, bacterium, virus, or any other organism which is beneficial to agriculture and which is not capable of being injurious to plants.</p> <p>"pest" means any vertebrate or invertebrate animal</p>

		(including the eggs of such animal), fungus, bacterium, virus, viroid, mycoplasma-like organism, weed, or any other organism which is or is capable of being injurious to plants and includes any dangerous pest.
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South Korea

Act on Fosterage and Support of the Insect Industry [Act No. 13463 of 2015]

The South Korean Act on Fosterage and Support of the Insect Industry (the Act) is a piece of legislation which deals specifically on the insect industry for South Korea. The Act generally aims at fostering and supporting the insect industry and supporting the promotion of understanding the ecological aspect of insects.

According to Article 1 of the Act, the purpose of the legislation is to contribute not only to the increase of the income of farming families and healthy development of the national economy but also to emotional cultivation of the people by fostering and supporting the insect industry, forming the basis of the development thereof and supporting the promotion of understanding on the ecology of insects.

Definition

Under the Act, the term "insect" has been defined to mean a stag beetle, rhinoceros beetle, firefly, *ptecticus tenebrifer*, *cetonia pilifera*, bumblebee and other animals prescribed by Ordinance of the Ministry of Agriculture, Food and Rural Affairs (South Korea). While the term "insect industry" means the business providing goods and services related to insects, such as breeding of insects or producing, processing, distributing or selling of products or by-products of insects, etc., which is prescribed by Presidential Decree.

Article 3 of the Act provides for the responsibility of the State and Local Governments to formulate and execute policies necessary for building the foundation to foster and support the insect industry and strengthening the competitiveness thereof.

Meanwhile Article 5 provides for the responsibilities of the Minister of Agriculture, Food and Rural Affairs (the Minister) for the formulation including comprehensive plans every five years in consultation with the heads of relevant central administrative agencies in order to foster and support the insect industry. The Minister shall also formulate and execute an annual execution plan in order to promote a comprehensive plan together with a detailed annual promotion plan for an execution plan in connection with an annual execution plan under Article 5 of the Agricultural Community Development Promotion Act. The comprehensive plan of the insect industry basically includes among other things, the present status and prospects, direction and objectives, investment plan, education on the related technology, experts, increase the income of insect farming families and education on the ecology for the promotion of understanding of the industry of insects.

It is also the duty of the Minister to conduct fact-finding surveys on the present status of the insect industry for the efficient formulation and promotion of a comprehensive plan and an execution plan as provided under Article 6 of the Act in which may request the relevant

research institutions, organizations, etc. to cooperate for the submission of materials or present opinions unless there is a compelling reason not to do so.

Article 7 of the Act provides for training of experts which allows the State and a local government to designate a university, a research institute, agency or organization established for the purpose of research on insects, as an expert training institution to provide necessary education and training and may fully or partially subsidize expenses incurred.

The Act also provides for the promotion of technological development related to the insect industry under article 8 which includes collaboration and exchanges of information on technology. Article 9 further promotes for international collaboration in terms of exchange of technology, human resources and joint research as well as advancing into overseas markets.

Article 10 provides for the assessment of potential harm caused by insects to prevent harm to the lives and bodies of human beings and to the ecological environment that are likely to occur in the process of mass breeding and distribution of insects and a person may get compensation for such loss.

In terms of standards and specifications for breeding of insects, it is within the powers of the Minister of Agriculture, Food and Rural Affairs to determine the types of insects that can be distributed or sold as natural enemy insects, pollen vectors, environment purification insects, edible or medicinal insects, educational or pet insects, etc. and the standards for breeding and specifications.

A report shall be filed for anyone in the insect industry who intends to produce including breeding insects, process, or distribute insects or the products or by-products of insects with the Metropolitan Autonomous City Mayor, the Special Self-Governing Province Governor, or the head of the relevant Si/Gun/Gu (the head of the relevant Gu refers to the head of an autonomous Gu, who has jurisdiction over the relevant place of business. The same applies for in the event of modification of the report.

Penalty provisions are under article 16 and 17. Article 16 provides for the punishment by way of a fine not exceeding five million won for failure to comply with a restriction or an order to discard insects under Article 10 (2) and any person who distributes or sells wild insects, in violation of Article 11 (2). Further to that, a person who fails to comply with a request for preventive measures under Article 12 (3) shall be punished by a fine not exceeding one million won.

Article 17 provides for administrative fines not exceeding three hundred thousand won for a person who produces, processes, or distributes insects or the products or by-products of insects without reporting, in violation of Article 12 (1), fails to file a report on modification required under Article 12 (2).

According to Professor Yeon Jae Bae from the University of Korea during a brief interview on the 6 September 2018 in Seoul, Korea, he mentioned that the insect industry in South Korea is focusing more to insect as feed for livestock before venturing further to food as human consumption.

Suggestions

The potential of insect production and rearing as well as the environmental and trade implications of the international movement of insects, are factors to be considered when drafting and implementing regulatory frameworks to cover a broad range of regulatory areas, including phytosanitary legislation, biodiversity, disease control and environmental protection.

Technological advances and societal challenges have created the need for new laws. The regulatory systems need to deal with insects as farmed animals and as ingredients. A thorough analysis of the existing policies and regulations on the use of insect as food and feed is necessary. The existing framework needs to be improved and the development of new policies are inevitable. Promotion of private and public standardization at the national and international levels for insects as food and feed must be accompanied by a premarket safety.

Apart from the Act on Fosterage and Support of the Insect Industry, South Korea also has the Act On Development and Support of Urban Agriculture which is to develop a nature-friendly urban environment by providing for matters regarding advancement and support of urban agriculture and to contribute to harmonious development of cities and rural communities by raising urban residents' understanding of agriculture. It is undoubtedly the vast potential of the insect industry which opportunity Malaysia should seize. Thus, this paper suggests that Malaysia should have a legislation of its own to regulate the insect industry. The future of insect as food and feed holds a huge potential which Malaysia should not miss out.

CONCLUSIONS

The question is whether Malaysia is ready to accept insect as food and feed in the near future? There is definitely the need to promote the establishment of appropriate international and national standards and legal frameworks to facilitate the use of insects as food and feed. The potential effects of insect production and rearing and the environmental and trade implications are irrefutable. These are possible inputs required when drafting and implementing regulatory frameworks for insect legislation to a broad range of regulatory areas. Malaysia should grab the wide opportunity spread across the insect industry in order to be a global player and the potential it promised. Therefore, Malaysia requires a systematic and structured legislation to foster and promote the insect industry and perhaps the South Korean Act on the Fosterage and Support of the Insect Industry could be considered as reference.

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LEGISLATIONS

Malaysia

Destruction of Disease Bearing Insects Act 1975.

Prevention and Control of Infectious Diseases Act 1988.

Feed Act 2009.

Pesticides Act 1974 (Amended 2004).

Animal Welfare Act 2015

Food Act 1983

Plant Quarantine Act 1976

South Korea

Act on Fostering and Support of the Insect Industry

Act On Development and Support of Urban Agriculture