STRENGTHENING ORGANIC INDUSTRY IN MALAYSIA THROUGH RESEARCH AND TECHNOLOGY

Illani¹, Z.I., Theeba¹, M. and Syahrin² Suhaimee  
¹Crop and Soil Science Research Centre  
²Economic and Science Social Research Centre  
Malaysia Agricultural Research and Development Institute (MARDI), Selangor, Malaysia  
email: illani@mardi.gov.my

ABSTRACT

Organic farming in Malaysia has been promoted since the mid-1990s and it been progressing well since then. The first domestic production of organic produce in Malaysia was sold through a subscription scheme among 500 families. Today, sales channels for organic products include specialized shops and supermarket chains and even through the internet. The production of organic produce in Malaysia in 2015 is about 66,000 tons with estimated value of US$ 40 million. The value increases every year, mainly for fruit and vegetables in line with the increase of organic farming size. As the demand from neighboring countries increases in healthy food consumption, Malaysia has started to export local organic products mainly to Singapore. Malaysian government encourage small-scale producers to invest in organic farming as an approach to increase their household income, promote the healthy food and environment as well as to contribute to the country's exports. Organic farming received government support through national regulations for the Malaysian Organic Certification Program (myOrganic) by the Department of Agriculture (DOA) in order to facilitate and encourage organic farming among farmers in the country. Department of Standard (SIRIM) has also reviewed the MS1529:2001 standard that certifies farms and organic produce based on the requirements in 2015 with several amendments. Apart from that, various funding for organic farming research and development are given by the Malaysian Government to support and encourage further the development of organic agriculture and healthy food production in the country. MARDI has been mandated to carry out research for organic agriculture through series of government funding's since 2006. The key research components carried out were on soil health and nutrient management, pests and diseases and the organic crop production system as a model to promote to farmers and target groups. Consultations on organic crop productions as well as developed technologies are being the main outcome of the R&D projects to be transferred to target groups and to support the organic farmers. As the demand increases for local healthy and safe food consumption in the country and neighboring countries, organic farming in Malaysia carries a high potential to be upscale and expanded to the bigger level in the future. Such sustainable agriculture development needs various support through further research and development, education, aggressive promotion and more effective marketing strategies.

Keyword: research and development (R&D), myOrganic, technology, innovation

INTRODUCTION

Increasing awareness on environmental issues and food safety has widened organic agriculture around the world. However, this practice is not new. The history of organic agriculture started long before the Green Revolution. At that time, chemical inputs, improved irrigation and modern varieties were used to boost agriculture production due to malnutrition and widespread hunger in developing Asia (Hazell, 2009). Nowadays, demand for “healthy” food including organic food is increasing, especially from European, U.S and other developed nations due to health awareness and clean products.

Initially organic agriculture in Malaysia was driven by Non-Governmental Organization (NGO) that is concerned about the quality of the consumed food and the active movement from around the world (Partap, 2010). The awareness on high chemical inputs used in conventional agriculture urged them to look for alternative sources of food. The Centre for Environment, Technology and Development Malaysia (CETDEM), an NGO based in Malaysia, started the initiative by conducting an experiment on growing multiple vegetables and fruits on one acre of land. In a few years, outputs from their farms have been penetrated into supermarkets.
in Kuala Lumpur. The success of their experiment as well as demands from consumers have led other farms to take the same approach and start venturing into organic agriculture.

The increasing demand for organic consumers that are willing to buy organic vegetables and fruits had pushed the opening of the first organic shop in 1999 to cater Klang Valley market. Private companies also took advantage on producing organic fertilizers for organic farmers. The turnover of organic products, mainly imports, was estimated at US$ 20 million in 2004 and the production at 900 hectares, mainly on fruits and vegetables. A large proportion of organic products are imported, while a small amount was exported to Singapore. Most organic fruits were imported from Australia, New Zealand, China, Korea and Japan (Ahmad, 2001). The local market in Malaysia is based on trust and most of them were domestic producers with no certification. Although there is an official voluntary national standard for organic farm through the Department of Agriculture which operates a certification system for free, no producers have been certified before the year 2000. The demand for organic products in Malaysia projected to grow more than 12.4% a year (Syahrin et al., 2016). In Malaysia, the local organic food industry is still small, as more than 60% of organic food products are imported. Most of the organic products are sold domestically, while some are exported to Singapore (Mohamad et al., 2014). The organic products from Malaysia which are exported to Singapore are fruits, vegetables and rice. Interestingly, Singapore is the only country to which Malaysia exports its organic produce. Most of it are consumed locally. The largest distributor of organic fruits and vegetables in Singapore is Zenxin AgriOrganic Food Pte Ltd from Malaysia and their products are distributed in supermarkets and hypermarket chains.

**ACCREDITATION AND POLICY**

**Organic in Malaysian Standards**

Seeing the potential of organic farming in Malaysia, the Department of Agriculture Malaysia (DOA) has been given mandate by The Ministry of Agriculture and Agro based Industry to set up an organic agriculture accreditation called Sijil Organik Malaysia (SOM) that has been launched in 2002 with 581 hectares and was accredited by SOM (Ramli, 2002). On the other hand, some companies had successfully penetrated the neighboring market and opened their own organic shop in their respective countries. The accreditation of SOM has been developed, supervised and accredited by the DOA to producers of organic farms that followed criteria and procedures under the Malaysian Standard MS 1529:2001 The Production, Processing, Labelling and Marketing of Plant Based Organically Produced Foods. Unlike other countries, commodities of organic agriculture in Malaysia are mainly from vegetables, fruits, herbs, mushrooms, rice and other plants. The organic standard for livestock in Malaysia is yet to be set up compared to Indonesia, Vietnam and Thailand that have organic aquaculture and even in Japan which has its own organic livestock and feeds. The standards have been reviewed back accordingly with the latest information from international body as IFOAM as well as with the development of organic industry which are tremendously growing and changing with time. Amendment with MS1529:2015 aims to protect the producers and consumers against the deception and fraud in the market place and unsubstantiated product claims. It is also to ensure that all stages of production, preparation, storage, transportation and labelling comply with the standard.

**Organic certification**

In addition, the Department of Agriculture (DOA) of Malaysia also rebranded their organic scheme with the changing of the logo SOM to myOrganic Malaysia and the launching of the new logo had been in March 2015. This myOrganic scheme is voluntary and the producer participated in this scheme did not pay any charge for the certification process. The certification is valid for one year and is renewable every year. (Fig.1).
Despite the optimistic view of the industry, between 2002 until 2016, currently the total number of farms certified is 179 farms with a total area of 1923 ha. The majority of organic farmers were in the Pahang states of Malaysia and mostly on vegetable farms and different commodities (Tables 1 and 2). Farmers were encouraged to grow organic vegetables due to the higher demand compared to other crops. The highest number of farms accredited was in 2011 with 29 farms that received myOrganic certification from both new and renewal applications. Total production in 2014 for organic produce from certified farms is 65,591 tons with an estimated value of US$40 million (DOA, 2015).

Table 1. Number of farms accredited by SOM/myOrganic based on commodities, 2002-2016

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<thead>
<tr>
<th>Commodity</th>
<th>Under myOrganic accreditation</th>
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<tbody>
<tr>
<td></td>
<td>No. of farms</td>
<td>Hectarage</td>
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<tr>
<td>Fruits</td>
<td>39</td>
<td>331.9</td>
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<tr>
<td>Vegetables</td>
<td>48</td>
<td>135.18</td>
</tr>
<tr>
<td>Rice</td>
<td>3</td>
<td>118.46</td>
</tr>
<tr>
<td>Others including mushrooms and herbs</td>
<td>89</td>
<td>1337.50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>179</strong></td>
<td><strong>1923.04</strong></td>
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Table 2. Summary of the number of farms under SOM/myOrganic certification, 2003 - 2016

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<tbody>
<tr>
<td>No. of farms received SOM/myOrganic accreditation</td>
<td>3</td>
<td>43</td>
<td>29</td>
<td>21</td>
<td>23</td>
<td>23</td>
<td>22</td>
<td>15</td>
</tr>
</tbody>
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**RESEARCH AND DEVELOPMENT (R&D)**

There is a misconception of organic farming and traditional farming with no technologies involved as conventional farmers are used to perceive. It is true, there are no pesticide usage and no genetic engineering microorganism allowed in organic system. However, there is no limit to the use of technologies aimed at increasing yield. It is important to understand the natural process like the exploiting mating habits of pests through monitoring system. Information from the processed data, organic farmers could optimize crop care and prevent damage to crop production. Technologies can be simple and broad but it is its application that matters. In the future, organic farming systems must apply these technologies in order to expand the organic industry in order to penetrate into the larger market.
Funds and grants for R&D

The introduction of integrated agriculture with technologies mainly emphasizes agro-forestry, mixed farming, rehabilitation of marginal land, recycling of organic wastes, land resources and water conservation as some of the measures taken to support sustainable agriculture in Malaysia. Government has identified organic agriculture as a niche market opportunity, particularly for small-scale producers (Ahmad, 2001). The government has also foreseen that the organic industry will be worth US$ 300 million and it targeted 20,000 hectares to be used for organic land. However, many issues came along as cooperation between the private sector and the government did not develop well but there is always a way for improvement. Organic farming always received governments support through Malaysian government policy through every Malaysian Five Year Plan since 1990 and the National Agrofood Policy (DAN 2011-2020) which encouraged small-scale producers to invest in organic farming to increase their income, protect the environment and promote the country’s exports. This also involved a certification scheme by the Department of Agriculture Malaysia to maintain quality and originality of organic products in the domestic market.

The source by Malaysian Science and Technology Information Centre (MASTIC) in 2015, in Figure 2, shows the gross expenditure (GERD) in Malaysia has been steadily increasing since 2000. The intensity of R&D, a measure of the percentage of GERD to GDP (GERD/GDP) also shows an increment since 2004. In 2012, the GERD/GDP was 1.13%, an increment of 43% compared to year 2008 (0.79%) and it has been targeted to be at 2.0% by 2020. The business enterprises (BE) remained the largest contributor to spur R & D activities in Malaysia from 2000 to 2012 (Figure 3) with a contribution RM6,840 million, 64.45%) of R&D expenditure in Malaysia, followed by institutions of higher learning (IHL) RM3,042 million (28.67%) and government agencies and research institutes (GRI) RM730 million (6.88%) and this covers all sectors of research areas.

Fig. 2. The gross expenditure (GERD) in Malaysia in 2000-2012. Source by MASTIC 2015
The Malaysia Agricultural Research and Development Institute (MARDI) as one of GRIs had invested more than RM85 million in agricultural research and with expected benefit returns worth more than RM10.2 billion especially in paddy breeding. It also promoted and started the research in sustainable farming since before 2000. Research that has been carried out particularly in composting, soil health, organic fertilizers, organic vegetable production system, organic fruit production and integrated farming system with animals. Baseline data acquisition of various research components has been achieved and has become an outcome of early research in organic agriculture. The current research is widened and focused into green technology which include sustainable organic agriculture system as holistic aspects in organic agriculture research as it includes waste management, integrated pest management, ecosystem engineering, integration with animals and technology package.

A case study also been carried out by the Economic and Social Centre of MARDI (Syahrin et al., 2016) on the adaption and application of a several basic technologies used by organic farmers in Malaysia, Indonesia and Japan in 2014. It showed farmers from Malaysia are still in moderate track as compared to other two countries (Figure 4). Malaysian farmers mostly gave emphasis on buffer zone to ensure the land separated from the conventional and less emphasis in the application of pests and diseases (P&D) control that might affect farm productivity. While, the Japanese farmer’s had emphasized the practice of mulching and use of organic fertilizers for soil quality. Indonesian farmers’ have always espoused on using legumes as basal fertilizers and the usage of local organic fertilizers. The ranking productivity of their farms showed as Japan > Indonesia > Malaysia. Thus the adaptations of new technologies from neighboring countries are needed as tools to boost the organic industry and its potentials need to be highlighted.

Fig. 3. Percentage of fund contribution for R&D activities
Innovation and commercialization

Research has the potential to be a crucial factor driving the organic agriculture move forward together with the support of the private sector research like industrial partners. Issues in organic agriculture such as low yields and quality of variety, P&D management, post-harvest handling and labor intensive should be given priority. Research innovation is needed in order to improve agricultural production. Some research has been done by GRI’s in organic agriculture would be a new quality varieties, biocontrol for P&D using beneficial bacteria and multi-virus, a designer fertilizer and portable machinery. Green technology for sustainable production becomes important today and it generates a positive impact with the introduction of more innovative products in market.

ISSUES AND CHALLENGES

Market driven from research also faced many challenges as the organic farm industry keeps evolving fast. Application of technologies in the organic farm sometime has not been accepted well as farmers still misunderstand its practicality. Extension officers must have proper channels in disseminating the right information to the farmers. Besides that other factors or issues and challenges in R&D are listed down.

High Costs and timescales

In R&D, the initial setup costs as well as continued investments are necessary to keep research work on a cutting edge quality. It also has to be relevant. Not all companies may find it feasible to continue this expenditure. Once a commitment to R&D is made, it may take many years for the actual product to reach the market and a number of years will be filled with no return on continued heavy investments.

Fear of loss

As not all research that is undertaken yields results, many ideas and solutions for research work are scrapped midway and the work has to start from the beginning. Another reason for resistance is fear that the innovation will be politically enfeebling and that new or outside products do not work and even will lose some control by adopting it. A good implementation plan by trial should be tried to identify where a loss of production may occur so that farmers can anticipate and possibly avert any problems arising from that loss. Because of its nature,
R&D is not always a guaranteed commercial success. In this regard, it may be desirable to acquire the required research to convert it into necessary marketable products.

Acceptance and quality of produce

There is always the danger that a significant new invention or innovation will render years of research obsolete and create setbacks in the industry with competitors becoming front runners for the customer’s business. It is important for any business to understand the advantages and disadvantages of engaging in the activities. Once these are studied, then the step can be taken towards becoming an R&D organization. Most of the consumers in Malaysia associate quality with the appearance of the agricultural produce. Due to this reason, consumers look for non-organic products and are more attracted to them as compared to their organic counterparts. Organic agriculture produce usually have minor defects which affects the appearance in general, while consumers expect to get the same appearance and quality with non-organic products due to lack of chemical used.

CONCLUSION

Organic agriculture industry in Malaysia is relatively moving forward even though not so much progress has been made in terms of policy. The research toward sustainable agriculture has gained attention to include organic agriculture research in the line. Strengthening the market system with incentives or subsidies to organic players will create more free market environment and current accreditation must be recognized globally as consumers will gain more confident in purchasing local organic produce. Technology derived from research must be spread effectively through extension and all partners especially those in the industry, the government and consumers must support each other towards a truly market driven industry.

REFERENCES