

TECHNOLOGY TRANSFER FOR YOUNG GENERATION ENTREPRENEUR THROUGH MARDI YOUTH AGROPRENEUR PROGRAMME

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ABSTRACT

MARDI is resolute in its efforts to develop appropriate, efficient and viable technologies and to provide technology leadership to young generation entrepreneur involved in the development of food and agriculture sectors. To realise this aspiration, MARDI through Youth Agropreneur Programme (PAM), enhance young generation entrepreneur through technology transfer and facility utilisation. In 2014, a total of 775 were participated as a young entrepreneur in food, agriculture and agro-based industry. More than 76% were given intensive training to support its needed such as technology transfer programme, entrepreneur development programme and model farm to young entrepreneur. About 150 young entrepreneur who have been running the project was able to earn up to RM5000 (US\$1387) per month. Furthermore, provision of land and appropriate technology as a crucial point to ensure the survival of young entrepreneur. However, this efforts was continuously implemented and transferred to create and development the competent young entrepreneur.

Keywords : young entrepreneur, agriculture and technology transfer

INTRODUCTION

The agriculture sector in Malaysia is still considered as secondary as compared to other more popular sectors such as manufacturing, commercial or even the government sector. This is largely due to the conventional opinion that the agricultural sector is a rough job with low salaries dan does not promise a direct good future for the people. It is considered not the right place especially for those with tertiary education. The youngster are more attracted to the glamorous jobs in factories and in commercial sectors.

In order to cultivate interest in youth into agricultural entrepreneurship, as it is in line with the national agenda. Young Agropreneur Program (PAM) MARDI was established on the basis of the existence of Agropreneur Young Unit (UAM) Ministry of Agriculture and Agro-based Industry (MOA) It aims to create a Agropreneur of a progressive, competitive, creative, innovative, and high incomes in the agricultural sector. This program is specially designed to help young people under the age of 40 years to form a generation that is able to move the agricultural sector to a more modern, dynamic and high income. The approach of this program is to assist and encourage the participation of young people in entrepreneurship (Agropreneur) based agricultural activities include all activities in the agricultural industry value chain, such as crops, livestock, fisheries, marketing, technology and innovation as well as special projects such as agrotourism projects and basic industries farming (Mohamad Kamal, 2014).

However, inspite of such efforts, agriculture entrepreneurship still fails to attract interest from the younger generations, and a number of causes have been identified. Norsida (2008) has highlighted that first, many youths are not properly informed about the agriculture courses, and second, entrepreneurship is commonly associated with unstable returns and profits, and that perhaps youths see agriculture entrepreneurship as being a high risk venture and are deterred by the risk of failure. Third, as William et al. (2004) highlight, there is a lack of exposure to and relevant information about the importance of agriculture entrepreneurship and food sufficiency. Furthermore, the young entrepreneur still lacks of land and capital to initiate the project (Jamaludin, 2011).

The implementation of these efforts is through the involvement of transfer MARDI technologies needed by technical support to young entrepreneur. Additionally, MARDI themselves have technology transfer activities such as pilot projects, an increase of scale, 'Model Farm' technology as well as technical training to accelerate the process of acceptance of the technology by the young entrepreneur.

BACKGROUND

The Malaysia Agricultural Research and Development Institute (MARDI) was established on 28 October 1969 in accordance with the MALAYSIAN AGRICULTURAL RESEARCH AND DEVELOPMENT INSTITUTE ACT, 1969 (ACT 11) and started its operation in March 1971. Its establishment was set with the objectives of generating and promoting new, appropriate and efficient technology towards the advancement of the food, agriculture and agro-based industries.

MARDI is managed and guided by the regulation and policies set by the MARDI Governing Board and consented by the Minister of Agriculture and Agro Based Industry. In matters pertaining to finance, the consensus of the Minister of Finance is also obligatory.

Whereas, the Scientific Council ensures that the MARDI technical programmes attain the highest quality and level of competence. MARDI is mandated to fulfil the following functions :

- To conduct researches in the fields of science, technical, economy and social with regards to production, utilization and processing of crops, livestock and food and integrated farming.
- To serve as a centre for collecting and disseminating information and advisory services pertaining to scientific matters, technical and economy related to food, agriculture and agro-based industry. Through publication of reports, periodicals and related papers and organizing of exhibitons, conferences, seminars and lectures.
- To serve as a centre that provides expert services in food, agriculture and agro-based industry such as consultancy services, laboratory analysis, quality assurance and contract research and development (R & D).
- Provision of various forms of trainings to cater for the development of the food, agriculture and agro-based industry.
- Provision of grant-in-aid for pure and applied scientific, technical and economic research and development related to food, agriculture and agro-based industry.

- To maintain liaison with local and foreign public and private organization engaged in scientific, technical, economic and social researches related to food, agriculture and agro-based industry.
- To conduct commercial research and production.
- To develop, promote and exploit the research findings.
- To provide extension services to the food, agriculture and agro-based industry.

It is imperative that MARDI, being a renowned and internationally recognized research organization, developed and transform the agriculture sector through R & D projects thus generating new innovative findings that can benefit the target groups.

Technology Transfer Approach

The emergence of a new technology in agricultural practices has made the sector more attractive to the younger generation. The effort drawn to involve more youngsters to become more self-reliance and eventually establish themselves as agriculture entrepreneurs is the outcome to be seen and proven via technology transfer.

I. Facilities

About eight (8) major station and twenty four (24) support station were involved in the transfer technology activities such as pilot projects, upscaling projects, model farms, test beds and incubators. Table 1 was indicated the location of MARDI State office and stations.

II. Methodology

The use of technology and innovation is the key to the transformation of the agricultural sector more modern, commercial and competitive. Thus, through research and development, MARDI has taken steps to provide technology for the young entrepreneur.

A series of meetings and discussions with young entrepreneur will be held to obtain detailed information about the background, interests, abilities, skills, infrastructure and existing facilities to determine the setup.

Before starting the project participants involved will be given technical training. Participants will also receive training *hands-on* from time to time according to needs and visits as part of the upgrade process knowledge. These activities will be implemented in a cluster either livestock, crops or agro-based industry to make it easier in terms of guidance and monitoring by expertise. For instance, the model farm was developed to accelerate technology transfer with R & D support facilities and packaged technology given to the agricultural entrepreneur. Details of technology transfer activities was shown in Tables 2.

Table 1 : Location of MARDI State office and stations

MARDI state office and station	Location
MARDI Station	<ol style="list-style-type: none"> 1. Langkawi, Sintok and Pendang, Kedah 2. Hilir Perak, Perak 3. Tanjung Karang and Klang, Selangor 4. Jelebu and Kuala Linggi, Negeri Sembilan 5. Kluang and Pontian, Johor 6. Mu'adzam Shah, Cameron Highlands and Kemaman, Pahang 7. Jerangau, Terengganu 8. Pasir Puteh, Bachok and Jeram Pasu, Kelantan 9. Saratok and Bintulu, Sarawak
MARDI Station & MARDI State station	<ol style="list-style-type: none"> 1. Arau, Perlis 2. Alor Setar, Kedah 3. Seberang Perai, Pulau Pinang 4. Kuala Kangsar, Perak 5. Johor Bahru, Johor 6. Cherating, Pahang 7. Kuala Terengganu, Terengganu 8. Kota Bharu, Kelantan 9. Kuching, Sarawak 10. Kota Kinabalu, Sabah
MARDI State station	<ol style="list-style-type: none"> 1. Gopeng, Perak 2. Seremban, Negeri Sembilan 3. Melaka
MARDI Headquarters	<ol style="list-style-type: none"> 1. Serdang, Selangor

Source : Annual Report MARDI (2013)

Table 2 : List of model farm

Model farm	Farm Location
Chilli and rockmelon production technology via fertigation	MARDI Langkawi, Kedah; Serdang, Selangor; Klang, Selangor; Kluang, Johor; Kuching, Sarawak and Kota Kinabalu, Sabah
Chilli production technology via fertigation	MARDI Alor Setar, Kedah
Mushroom seeding and planting technology	MARDI Klang, Selangor
Lowland temperate crop fertigation technology	Entrepreneur Guidance Complexes, Pagoh, Johor
Strawberry production via fertigation	MARDI Cameron Highlands, Pahang
Coconut based integrated farming technology	MARDI Hilir Perak, Perak
Integration of Dorper goat and coconut technology	MARDI Cherating, Pahang
Integration of Boer goat and fruit crops technology	MARDI Jeram Pasu, Kedah
Herbal crop production technology	MARDI Linggi, Melaka
Mango and salak production technology	MARDI Bukit Tangga, Kedah
Mango production technology	MARDI Jelebu, Negeri Sembilan dan MARDI Arau, Perlis
Salak production technology	MARDI Jerangau, Trengganu
Aerobic rice production technology	MARDI Seberang Perai, Pulau Pinang
Mango Harumanis production technology	Perlis's group of farmers

Source : Annual Report MARDI (2013)

A model farm project was designed to promote and commercialize MARDI technology for selected crops and livestock. The entrepreneurs will be directly involved in the management and implementation of the projects and will be facilitated in the commercialization of the technology such that the farm become a training and references centre for other entrepreneurs.

III. Delivery System

The project will be handled solely by young entrepreneur and supervised by MARDI. Technology transfer will be given by members of the task force to be appointed who have expertise and experience in the relevant field.

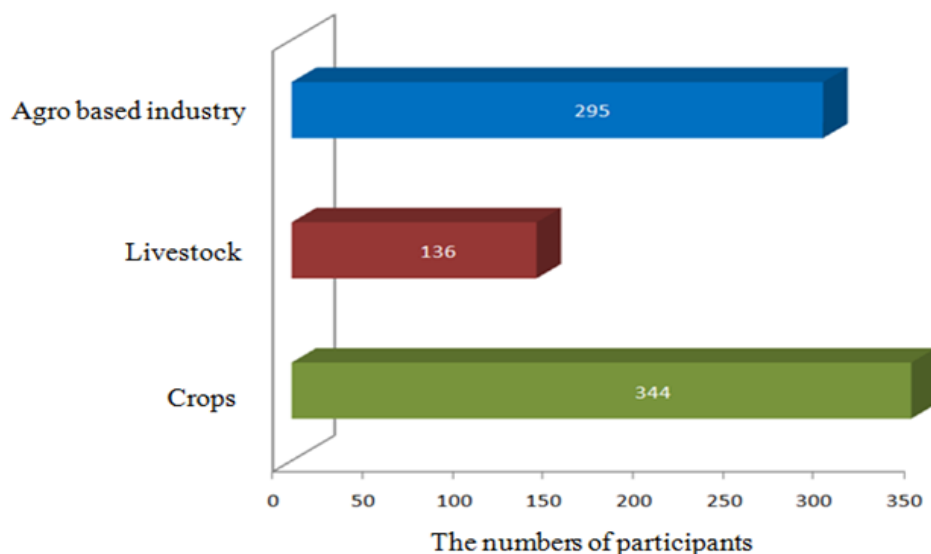
An efforts towards technology transfer and commercialization were also extended through entrepreneurial development programmes, pilot projects, upscaling projects, model farms, test beds and incubators. People-oriented programmes such as the Client Day and MARDI Field and Open Day were also conducted at station level.

MARDI Youth Agropreneur Programme

A total of 37 activities of technology transfer have been done in 2014 which includes training 'Hands-on', workshops, and courses. MARDI Young Agropreneur Programme has held 'BizTalk Series 1: Business Entrepreneur' interests of nearly 400 participants. This 'BizTalk' series has a huge impact on young entrepreneurs in offering business packages to the youth who are interested to run the business. A platform for discussion among entrepreneurs, youth and authorities were done concurrently.

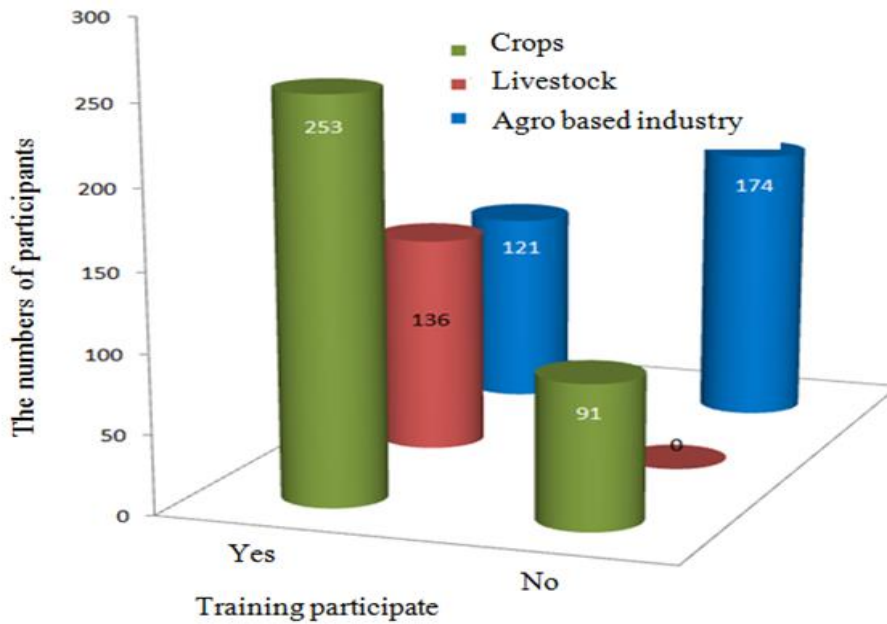
About 775 participants were interested to join MARDI Young Agropreneur. This amount covers in the field of livestock, crops and agro-based industries. Fractional parts of plants covering a total of 344 participants, 136 (livestock) and 295 (agro-based industry) (Figure 1). However, only 76% (510 participants MARDI Young Agropreneur) who was participated in the training. Figure 2, the percentage of participants who received training in proportion to crops, livestock and agro-based industries.

Figure 1 : Number of MARDI Young Agropreneur



Source : Youth Agropreneur Programme Report (2014)

Figure 2 : Fraction of training participate on each sectors



Source : Youth Agropreneur Programme Report (2014)

Scenario of idle agriculture land in Malaysia

Land as an asset is riskless property that generates income and wealth to the owners. Land price continues to increase with the growth of urbanization and industrialization since its supply is limited. Originally the issue was recognized as the consequence of absentee landlords who failed to attend to the land they owned.

Land itself also functions as an essential factor of production. The agricultural land can be utilized for the production of fruits and vegetables. Because of these multifunctional uses; for productive and for ownership and accumulation of wealth, land is always in demand for fulfilling numerous economic goals of the investors and speculators. Partly due to these reasons idle land will continue to exist since the investors as landowners are not the same persons as cultivators of land. Nevertheless, this phenomenon has provided opportunity for those who wish to rent land for the cultivation of crops.

Malaysia has a land area of 32.98 million ha with only about 31% of it being arable (Table 3). Agriculture is one of the main land use in Malaysia (Aminuddin et al., 1990) and has played a major role in economic development of the country as a source of food, employment, export earner and raw materials for agro based industries (Arshad, 2007) (Tables 4). More so, of the Malaysian total arable land, available record showed that over 70% is dominated by tree crops plantation (Wong, 2007) thus threatening sustainable food crop production in the country. More so, the development of agriculture from independence until date has been impacted by series of economic policies designed to transform the country into an industrial and a high-income nation (Md Mamudul et al., 2010).

Table 3 : Land distribution and land use in Malaysia, %

Region	Malaysia	Peninsula Malaysia	Sarawak	Sabah
Total land area, million ha	33.03	13.16	12.24	7.63
Land area suitable for agriculture, million ha	10.31	6.19	1.81	2.31
Land area suitable for agriculture, %	31.2	48	15	31
Land area unsuitable for agriculture, %	68.8	52	85	69

Source : Aminuddin et al (1990)

Table 4 : Sectoral contribution to GDP (1960 – 2000, %)

Sector	1960	1970	1980	1985	1990	1995	2000
Agriculture	37	31	23	20.7	20	13.6	10.5
Mining	9	10	15	10.4	14	7.4	5.7
Manufacturing	9	13	20	19.6	26	33.1	37.5
Services	45	46	42	49.3	40	45	46.8

Source : Jomo (1990) and Bank Negara Malaysia, Annual Report

Idle land is defined as cultivable agriculture inland or farms with a minimum 0.4 hectare with contiguous or dispersed ownerships, left unattended for three years and above consecutively. Based on this agriculture department definition a total of 531.8 thousand hectares were classified as idle lands in 2009. By 2012 through concerted effort this total figure had been reduced and remained at 97.3 thousand hectares (DOA, 2012).

Azima and Ismail (2009) asserted that agricultural sector is undoubtedly important as it saves billions of dollars on imports of products. The concern lies in the existing agriculture idle land and low productivity which should be addressed to overcome the shortage of domestic production. According to official source about 1.44 thousand hectares of agriculture lands in Peninsular Malaysia are categorized as idle agricultural land (DOA, 2009). This constitutes about 35 per cent of the total agriculture land in the country. The opportunity of idle land for immediate cultivation with high market oriented crops would directly benefit the country. Their findings show that efforts initiated by government often meet with limited success. Vaiphasa et al. (2011) realized the importance of idle agriculture land to the economy as sources of income and employment to the country

Utilization of idle land in MARDI

The agriculture land use in MARDI area was influenced by the implementation of policies that gave priority to R & D development. In which, priority of MARDI activities were to transform the agriculture sector through R & D projects thus generating new innovative findings. Nevertheless, in some cases the young entrepreneur was given an opportunity to use land in MARDI area for agriculture purpose. MARDI technology (model farm) for instance,

change in agricultural land use in favor of highly rewarding and better-demanded crops (fruits and vegetables) thus causing agricultural land use dynamics.

Therefore, the number of young entrepreneur pursue to utilize idle land of MARDI area increment drastically. In 2014, about twenty (20) young entrepreneur were selected to utilise the idle land for agricultural purpose. Table 5, about ten (10) of them were growth rockmelon and vegetables via fertigation system, 7 (bee ‘kelulut’ keeping) and 3 (mushroom seeding and planting).

Table 5 : List of model farm were utilized by young entrepreneur on idle land of MARDI.

Model Farm	Farm Location	Size of Land (Acre)	No. of Participant
Rockmelon production technology via fertigation	MARDI Klang, Selangor	2	2
Mushroom seeding and planting technology	MARDI Klang, Selangor	2	2
	MARDI Serdang, Selangor	6	1
Vegetables production technology via fertigation	MARDI Klang, Selangor	7	7
	MARDI Sintok, Kedah	1	1
Bee ‘Kelulut’ Keeping	MARDI Cherating, Pahang	6	5
	MARDI Kundang, Selangor	1	1
	MARDI Kuala Kangsar, Perak	1	1

Source : Youth Agropreneur Programme Report (2014)

During the implementation of model farm by young entrepreneurs, some constrain have been faced for instance,

- Lacks of capital / budget
 - Fertigation technology needs high initial expenditure for build-up the system.
- Lacks of appropriate machine / equipment
 - Needs a laboratory apparatus for set-up the lab for mushroom seeding.
- Lacks of expertise / man power
 - Most of the technology required an expertise to be done.
- Lacks of motivation
 - In some cases, a young entrepreneur has faced failure in their project. This might be his / her lost their motivation.
- Lacks of land area for planting.
 - Land area provided for planting was not enough to generate a profit.

Through ongoing discussions within young entrepreneur and MARDI management, the constrain will be solved by,

- Provision of an appropriate technology
 - Use an appropriate technology provided by MARDI
- Provision of appropriate agriculture area
 - A number of areas adequate to utilize for agricultural purpose
- Provision of discussions with multi discipline expertise
 - Multi discipline expertise required to solve a problems collectively.
- Provision of technical advice
 - Technology expertise ensure their technology was accomplished transfer.
- Provision of project monitoring for ensure in the line of project objective.

Government initiative project : National Blue Ocean Strategy (NBOS)

The National Blue Ocean Strategy (NBOS) is a national programme that contribute new ideas to change the thinking and perception of government officers so as to translate best practices that will benefit the public and the community through the government delivery system. In addition, to enhance the performance of the public administration system with the adoption of elements of the Blue Ocean Strategy. Therefore, presently, as collaborating within public and private agencies in formulating and implementating of a remarkable cooperation through various programme.

Under NBOS 3, 'Engaging Rural Labour for High Value-added Economic Activities on unused Government Land', where MARDI has been appointed as the lead agency to implement and ensure sustainability of the project to achieve the targeted goals of developing the land and agro-based skills among youths and retirees. The development involves land clearing and installation of greenhouse and fertigation system. This project has successfully trained seventeen (17) youths as young agricultural entrepreneurs, in which two (2) of them managed to have their own rockmelon farms with a monthly average income of RM5,000 (US\$1387). This project has successfully enhanced cooperation among government agencies to maximise the use of resources and facilities, and break the silos in the implementation of government projects.

Successful young entrepreneur through MARDI Youth Agropreneur Programme

In 2014, about 150 young entrepreneur who have been running the project was able to earn up to RM5000 (US\$1387) per month. Some of them was aimed to achieve in 'Phase 3 or more' in terms of sale (more than RM100,000.00 / US\$28,100.00 per year)(Table 6). Phase 5 was the higher achievement in which earned more than RM5 million (US\$1.4 million) per year in sales. Details of some successful young entrepreneur through MARDI Youth Agropreneur Programme was shown in Table 6.

Table 6 : Some of the successful young entrepreneur

Company	Project	Location of the project
KMS Agronomi Sdn. Bhd (Owner : Mr. Muhammad Sidek Osman)	Rockmelon via fertigation	Jenjarom, Selangor
Chemara Agrofarming (Owner : Mr. Addy Rendra Samuri)	Rockmelon via fertigation	Klang, Selangor
	Ginger via fertigation	Jalan Kebun, Klang, Selangor
My Iqra Solution (Owner : Mr. Muhammad Sazali Paridudin)	Bee 'Kelulut' keeping	Lubuk Manggis, Ulu Langgat, Selangor
Humaira Agriculture (Owner : Mrs. Nor Fadzilah Muhammad Zaidi)	Bee 'Kelulut' keeping	Shah Alam, Selangor
Setia Agro Capital (Owner : Mr. Muhammad Sharizan Mohamed Yunan)	Cucumber via fertigation	Karak, Pahang
Azma Tech (Owner : Mr. Mohd Noriman Mohd Nor)	Mushroom seeding and planting	Jalan Kebun, Klang, Selangor
Triple I-Ranch Sdn. Bhd (Owner : Mr. Mohd Inam-UI hasan Mohamad)	Livestock	Lenggeng, Negeri Sembilan
P & P Tani Maju Enterprises (Owner : Mr. Mohd Norulfirdaus Mat Alif)	Rockmelon via fertigation	Seri Kembangan, Selangor
Hanman Resources (Owner : Mr. Mohd Yuzir Hamidon)	Chilli via fertigation	Cheras, Selangor

Source : Profile of 100 Youth Agropreneur (2014) and Youth Agropreneur Report

CONCLUSION

The success of the project is not only measured in production capacity but also the ability to attract the young entrepreneur towards efficient modern agricultural technologies (model farm) that provided high value to the agricultural practices. This is a new approach of the MARDI in helping the young especially to be a successful entrepreneurs by provided a land and appropriate technology. Furthermore, to increase the percentage of young people to be participating in agriculture industry. The implementation of the effort will fulfil the MARDI to develop and enhance the well-being of the young entrepreneurs.

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