

A DEVELOPMENT OF SMART VILLAGE IMPLEMENTATION PLAN FOR AGRICULTURE: A PIONEER PROJECT IN MALAYSIA

Norizan Abdul Razak¹, Jalaluddin Abdul Malik², and Murad Saeed³

¹Universiti Kebangsaan Malaysia, Malaysia, norjef@ukm.my

²Universiti Kebangsaan Malaysia, Malaysia, jbam@ukm.y

³Universiti Kebangsaan Malaysia, Malaysia, muradsaeed16@yahoo.com

ABSTRACT. The current study mainly aimed to investigate the Malaysian Smart Village project in a rural community which is labeled as Kg Besting in Malaysia. Specifically, the study intended to address the major issues faced by the community of farmers, identify the Smart Village indicators and put forward a strategic plan for the Smart Village implementation. It was carried out among Malaysian farmers in Kg Besting community in Malaysia. Data was collected through a survey, focus group interviews and documents. The quantitative and qualitative analyses of the data revealed that the major issues faced by the farmers in this community in agriculture are limited involvement of human capital in agricultural activities, the small size of land and limited knowledge of using technologies and innovative techniques to enhance the agricultural processing and production. Other issues are relevant to Micro Small Medium Entrepreneurs (SMMEs) in Kg Besting include lack of raw materials and crops, lack of machinery, limited knowledge and lack of advice and networking on how to ensure mass production and healthy marketing competition at the regional and global levels. Thus, the study emphasizes the importance of meeting the community's needs in Kg Besting and offers several useful recommendations. In conclusion, by incorporating the concept of "Smart Village", the current study considers the potential Smart Village as an innovative means of improving rural people's life and it introduces a strategic implementation of the Smart Village project in Kg Besting in three phases; social empowerment, developing the Smart Village ecosystem and economic empowerment.

Keywords: Social empowerment, smart village ecosystem, SMMEs

INTRODUCTION

Smart communities and smart villages are being developed worldwide. Smart community is defined as a community with a vision of the future that involves the application of information and communication technologies in a new and innovative way to empower its residents, institutions and regions as a whole (Wilson, 1997; Jung, 1998; Smart Community International Network SCIN 2003; Lindskog, 2005). A smart village is a concept which refers to a set, series or even a bundle of services being delivered to a group of residents inhabiting that particular rural area and businesses effectively and efficiently (Viswanadham, 2011).

The concept of smart community or village has become a global phenomenon that exists all over the world (Coe et al., 2001; Lindskog, 2005). What has made this a globally increasing phenomenon is undoubtedly the recent development in information communication

technologies (ICTs Kim et al., 2012). Integration of ICTs in projects aiming to empower rural communities in different countries is evident of the positive impact on rural people's economic empowerment (Lennie, 2002; Kim, 2006; Mittal et al., 2010; Suliman et al., 2011; Braun, 2011). It is also believed that the smart paradigm should cover smart homes as a way of enhancing the quality of life (Harper, 2003 & Kim et al., 2012). For the last few years, several initiatives have been carried out and reported in different parts of the world. For instance, in India, real-life projects based on various ICTs enable rural communities to update their information on a daily basis with the villagers' assistance themselves and market their agricultural products via the internet (Suresh, 2011). Moreover, the Smart Rural Aggregation Platform (SRAP) was implemented to transform rural villages of India into smarter villages. The project aimed at promoting agriculture advisory and extending services to meet the rural needs and solve problems encountered by farmers as to enable them to increase their income, wages and self-employment. In the second stage, supply chains, e-governance services, a rural help line, micro financing and other services would be set up to enhance or increase India's villages up to the technological speed of its cities, and to enhance the standard of living and prosperity in rural areas. A project called Sautiyawakulima conducted in Swahili, Tanzania was reported (Banks, 2011). In using mobile phones in searching for knowledge and information related to agriculture and marketing, it was reported that they could record geographically localized observations about changes in the climate, access and share knowledge related to challenges faced by them in agriculture.

Several previous empirical studies highlighted the importance of farmers' adoption of new technologies in agriculture in rural communities in different contexts of the world. This is because adoption of technologies among farmers is a major criterion in evaluating project success. Yet, several challenging barriers, issues and factors affecting farmers' adoption of new technologies in their agricultural practices have been reported. These include farmers' lack or inadequate knowledge about technologies (Sebadieta, 2006; Subedi et al., 2009; Delgermaa, 2010), awareness of the technology (Subedi et al., 2009; Subedi et al., 2011; Liu, 2011), farm size (Sebadieta, 2006 & Liu, 2011), lack of investment capital or lack of financial support (Lubwama, 1999 & Delgermaa, 2010). Other factors are education, farming experience, land ownership, membership or belonging to farming organizations (Sebadieta, 2006 & Liu, 2011) and required inputs (Delgermaa, 2010).

In the Malaysian context, the Smart Village project aims at empowering rural communities or villages with ICT-based applications to solve or overcome several challenges (Wahome & Rubinstein, 2011). Currently, Malaysia is attempting to scale up the smart village initiative by replicating the RimbunanKaseh model at as many as 12 sites in the short to medium term. This community model is established in north-east of Kuala Lumpur, and it comprises 100 affordable homes and recreational facilities for high-tech education and training, and a creative agricultural system which is designed to provide both food and supplementary income for villagers. Thus, the model provides a holistic change for people and especially those in rural communities (Collins, 2012).

The present study aimed to address the major issues faced by the community of farmers in the Smart Village in Kg Besting in Malaysia and put forward a practical strategic plan to implement the Smart Village project successfully.

METHODOLOGY

The current study was carried out among 400 participants (males and females) in Kg Besting in Malaysia. Table 1 shows the demographics of the participants in this study in terms of their age. They are distributed in five groups with the number of the participants represented in percentage (%).

Table 1. Demographics of Participants' Age.

Age Groups	No in Percentage	Total No.
> 20	7%	
21-30 year	13%	
31-40	14%	
41-55	38%	
> 56	28%	400

Table 2 below presents the major areas for residency, agriculture, governmental reserve and public amenity. Their sizes are measured by acres and in the target smart community, each family was provided a half-acre of land for a lot with total of 100 lots.

Table 2. Measurement of the Area by Acres.

Areas	Acres
Residency Area	150
Agriculture Area	2,757.5
Reserve Area	25
Public Amenity Area	8.5

The current study used a mixed method for data collection and data analysis. For collecting the necessary data, three types of instruments for data collection were used; a survey, focus group interview and document analysis. It also used both quantitative and qualitative analyses. Thus, for the overall procedure of the study, the study was carried out in six practical steps as shown in Figure 1 along with their timeline.



Figure 1. The Study Procedure

FINDINGS AND DISCUSSION

Although the study used mixed methods to data collection and data analysis as previously mentioned, in this paper, we highlighted only the most important results and especially those

obtained from the data collected through the survey. Thus, the main issues found in the analysis of the data are discussed as follows:

Involvement of Human Capital in Agricultural Activities for the Smart Village

There results of this study showed that the first agriculture related issue is concerned with the respondents 'involvement in agricultural activities. It was found only 12% of the respondents were involved in full-time agricultural activities while the majority of them (88%) were not involved full time. Moreover, those full time farmers were 41 years old and above while the youth groups aging from 18 to 40 years old stated that they were not interested to pursue farming like their fathers and forefathers due to more attractive jobs available at nearby town and cities surrounding Banting, Sepang and also Putrajaya. Based on the results of the income generated from agriculture, only (1%) generated more than RM3000 per month, (1%) RM2000-RM3000 per month, (4%) RM1000-RM2000 per month and (6%) below RM1000 per month. This indicates that those involved in agri- based activities did not make good and impressive income.

Size of Land for Agriculture for the Smart Village

Other agriculture related issues are those associated with the land size. Because of the small land area for farming, the community in Kg Besting was found to work in small clusters and a limited coverage area for marketing and distribution of end products. Therefore, the findings of the focus group interview indicated that there was a lack of effective networking in producing, processing and marketing. The production per week and per month was reported to be small in quantity and there were not enough main power and machinery to assist large scale productions. .

Limited Knowledge of Technologies and Techniques in Agricultural Activities

Concerning the third factor, knowledge of technologies and techniques, the focus group interview showed that the majority of the farmers were still facing problems in utilizing and accessing the latest technology and farming techniques. Among the problems encountered are inadequate supply of quality seeds, limited knowledge on cash crop disease, technology, infrequent use of machinery for the agricultural project and SMMEs, limited time to learn how to use technology, limited communication channels and limited knowledge of the quality of products. Thus, only 3% of farmers reported the use of agricultural machinery while 93% of farmers did not use of agricultural machinery at all.

SMMEs

The results identified several active SMMEs in Kg Besting. Some of them included processing and selling fried chicken, salting and drying fish, making fish crackers, cakes, chili sauce, Soy Paste (Tempe), banana chips, tapioca chips and sukun chips and other agricultural products. Yet, these SMMEs faced issues including lack of crops, lack of raw materials to enable them to meet the market demands, lack of equipment and machinery to assist them in production of chips and crackers, lack of knowledge to ensure mass production and also longer shelf life of some products and lack of networking with experts and stakeholders. Other issues are concerned with need for advice from the relevant agencies in terms of marketing and packaging, unfair distribution of government facilities such as premise and loans and lack of a comprehensive guide on entrepreneurship and too complacent on what they are doing. There are some monitoring efforts done by various agencies but very minimal.

Process and Production in Agriculture

In relation to process and product and marketing in kg. Besting, there were some monitoring efforts done by the Department of Agriculture (29%), others (18%), PPK (17%), FAMA (12%), Their Own (12%), LPP (6%) and the Veterinary Department (6%). Yet, these efforts are not sufficient. Based on the current system, the farmers sell their products at farmers' market 27%, night market 10% and supermarket 7%. Moreover, the agencies that provide assistance for marketing of agricultural products among farmers in kg. Besting were LPP (35%), Association of Farmers (27%), the Department of Agriculture (19%), FAMA (16%) and Non-Governmental Organizations-NGOs (3%). Other organizations such as cooperatives can also help farmers to market their agricultural produce. Private sector such as Maidin Hypermarket can be partners for local farmers if the packaging of agricultural produce is of high quality and attractive.

RECOMMENDATIONS OF THE IMPLEMENTATION OF THE SMART VILLAGE

In order to ensure the success of Smart Village initiative in agriculture there is a need to firstly identify who are the stakeholders and major players for Kg Besting community. This is important as not all are ready to be part of the initiatives due to several reasons such as not having business yet, not involved in farming and agri-based related activities, low motivation and attitude, too old and not interested and also due to the low information and network needs. However, if more time is given to implement the initiatives the change of mindset and attitude is a must for all the community to ensure any projects and incentive injected will be well received and successful. We suggest the implementation to be phased in three timeline periods as shown in Table 3, Table 4 and Table 5 respectively.

Table 3. Implementation Plan Activities: Phase I

Phase 1	Activities
Introduction Social Empowerment	Identifying the major players Motivation and Workshop on <ol style="list-style-type: none"> 1. Literacy 2. Technology hand phone, smart phone and ICT 3. Attitude, 4. Change of mindset, 5. Opportunities and 6. The significance of Smart Village initiatives Every week for different group and needs to ensure that the community touch base with the experts and able to gain as much understanding as possible
	Workshop on the CUG and actual implementation
	Building of expertise by networking with Agri Related agencies and information sources Establishing network with natural, financial and skilled human resources Building knowledge and links with industry , Networking with landscape , and climate experts and service providers for the village
	Workshop on agri -operation, production and promotion
	Mini Carnival Kg Besting for community buy in and introduction of the project to community at large and CSR involvement

Table 4. Implementation Plan Activities: Phase II

Phase II	Activities
Development Smart Village Eco-system	social and political organizations; infrastructure, logistics and Information Technology, communication services that connect the companies and the states to the external economic and social environment; and resources including Modification and continuation on CUG workshop and expending the knowledge bank to include the followings <ol style="list-style-type: none"> 1. Education 2. SMMEs 3. Community well being 4. Promotion and Marketing 5. Employment 6. Networked Communities Building up expertise and references
	Building the stakeholders participation and roles <ol style="list-style-type: none"> 1. Government agencies 2. Farming community such as Mardi, Fama 3. Education related institutions 4. Health related institutions 5. SMMEs, SME Bank, and other loan/credit agencies 6. Private agencies for CSR and community development program 7. Social and political organization 8. International liason for example with Telecenter.org Training and developing networked communities via web based communication

Table 5. Implementation Plan Activities:Phase III

Phase III	Activities
Impact-Economic Empowerment	30% Increase of production 30% Increase of promotion e- inclusion activities increase popularity and network established start-up of ICT based industries and mobile entrepreneurs

CONCLUSION

The findings of the current study revealed several issues encountered by the farmers in Kg Besting in Malaysia. The most prominent issues are their limited involvement in agricultural activities, the small size of land and limited knowledge of using technologies and innovative techniques to improve the quality of agricultural products. The study also highlighted other issues associated with the development of SMMEs and marketing in Kg Besting. Therefore, the study recommends that for successful implementation of the smart village initiative in Malaysia, there is a need for carrying out this implementation in three phases; social empowerment, developing the smart village ecosystem and economic empowerment.

ACKNOWLEDGMENTS

We would like to thank Malaysian Industry-Government Group for High Technology, Universiti Kebangsaan Malaysia (UKM),UKM Paharundings for the travelling grant provided.

REFERENCES

- Banks, K. (2011, November 30). *From smart phones to smart farming: Indigenous knowledge sharing in Tanzania*. Retrieved from <http://newswatch.nationalgeographic.com>
- Braun, P. (2011). *Endeavour research fellowship. Project Report, Centre for Regional Innovation & Competitiveness University of Ballarat, Vic, Australia*. Retrieved from http://www.cric.com.au/resources/Braun_2011%20Endeavour%20Research%20Fellow%20Report.pdf
- Coe, A., Paquet, G. & Roy, J. (2001). E-Governance and Smart Communities: A Social Learning Challenge. *Social Science Computer Review*, 19(1), 80-93.
- Delgermaa, C. (2010). Introducing new technologies for sustainable agricultural development in Mongolia : towards a collaborative and effective extension system. <http://hdl.handle.net/10388/etd-05242011-204647>
- Harper, R. (2003). *Inside the Smart Home*, Springer. Retrieved from <https://nit.felk.cvut.cz/~dark/ProjektVTymu-RizeniProstredi/Clanky/Inside%20the%20Smart%20Home.pdf>
- Jung, J.G. (1998). Smart Communities: Digitally-Inclined and Content-Rich. *New Telecom Quarterly*, 19-26. Retrieved from http://www.tfi.com/pubs/ntq/articles/view/98Q1_A3.pdf
- Kim, M. J., Cho, M.E., Hong, H.O., & Kim, J.T. (2012). Placemaking: The role of smart communities and services in the housing complex. *SHB2012 - 8th International Symposium on Sustainable Healthy Buildings*, Seoul, Korea, 105-124. Retrieved from <http://www.sustainablehealthybuildings.org/PDF/8th/mijeongkim.pdf>
- Lennie, J. (2002). Rural women's empowerment in a communication technology project: some contradictory effects. *Rural Society*, 12(3), 224-245. Retrieved from <http://rsj.e-contentmanagement.com/archives/vol/12/issue/3/article/1297/rural-womens-empowerment-in-a-communication>
- Lindskog, H. (2005). Smart Communities Initiatives. *The Information Institute*, 83-101. Retrieved from www.heldag.com
- Liu, Z. (2011). *Which Factors Affect Farmers' Willingness for Soil Testing Technology Adoption: A Case Study of Tai Lake Watershed, China*. http://polisci.msu.edu/downloads/STTAdoption_MSU_011811.pdf
- Lubwama, F. B. (1999). Socio-economic and gender issues affecting the adoption of conservation tillage practices. <http://www.atnesa.org/contil/contil-lubwama-gender.pdf>
- Mittal, S. S., Gandhi, & Tripathi, G. (2010). Socio-economic impact of mobile phones on Indian agriculture. Indian Council for Research on International Economic Relations. Retrieved from <http://www.colombiadigital.net/newcd/dmdocuments/89.%20Socioimpact%20agriculture.pdf>
- Sebadieta, R., B. (2006). Factors affecting the implementation of acquired skills and knowledge presented to farmers at Denman Rural Training Centre in Gaborone Agricultural Region, Botswana. *Master Thesis in Science Agricultural Extension*. University of Pretoria. <http://upetd.up.ac.za/thesis/available/etd-08082007-163412/unrestricted/dissertation.pdf>
- Subedi, M.; Hocking, T.J.; Fullen, M.A.; McCrea, A.R.; Milne, E., Wu, B. & Mitchell, D., J. (2009). *An awareness-adoption matrix for strategic decision making in agricultural development projects: a case study in Yunnan Province, China*. <http://hdl.handle.net/2436/85975>
- Subedi, M., Hocking, T.J., Fullen, M.A., McCrea, A.R. & Milne, E. (2011). Factors influencing the effectiveness of an agroenvironmental project in China. <http://dx.doi.org/10.5367/oa.2011.0036>

- Suliman, V. R., Kalaivani, J. N., Mittal, N., & Ramasundaram, P. (2011). ICTs and empowerment of Indian rural women: What can we learn from on-going initiatives? *Centre for Research on Innovation and Science Policy (CRISP) Working Paper*, 100. Retrieved from <http://www.e-agriculture.org/content/icts-and-empowerment-indian-rural-women-what-can-we-learn-going-initiatives>
- Viswanadham, N. (2011). Smart villages and smart cities. *Presentation at the Global Asia Institute, Singapore*. Retrieved from http://www.nus.edu.sg/globalasiainstitute/events/speakerseries/downloads/ProfViswanadham_PT_140210.pdf
- Wahome, M. & Rubinstein, E. (2011). Malaysia collaborates with the new york academy of sciences to develop an innovation-based economy. *Malaysian J Med Sci*. Jul-Sep 2011; 18(3): 1-3. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3216235/>
- Collins, T. (2012, July 16). *Pioneering self-contained 'smart village' offers world model for rural poverty relief*. Retrieved from http://www.eurekalert.org/pub_releases/2012-07/migf-ps071212.php