CHALLENGES OF RICE STRAW AGRIBUSINESS DEVELOPMENT: AN ENTREPRENEUR'S PERSPECTIVE

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Abstract

Apart from knowing the environment and human impacts of rice straw burning, straw-utilisation would seem to be an environmentally and human-friendly practice. Focusing on agribusiness development, entrepreneurs have a vital role in managing sustainability issues. This study was geared towards the barriers and challenges of entrepreneurs to boost rice straw-use in agribusiness development. A total of 44 entrepreneurs were interviewed in the MADA region (n=24) and Sekinchan (n=20) in Malaysia. The study points out five major problems influencing stagnation in straw agribusiness. They are lack of support from authority and community; lack of research and access to technology facilities; low level of skills and knowledge; and lack of capital. Other problems are the entrepreneur's attitude; limited markets; availability of raw material (straw) and lack of skilled workers. An integrated and more efficient approach from institutions, stakeholders, the community and entrepreneurs themselves should be reinforced to ensure straw by-products become more widespread in the market.

Keywords: agribusiness, by-products, entrepreneur, straw, sustainability

1. Introduction

In Asia, straw is mostly managed through on-field burning and or left in the field. Sometimes, straw is often removed from fields for livestock bedding and feeding, household energy and off-field purposes (Rosmiza et al., 2014; Bijay-Singh et al., 2008). Straw open- burning is a controversial practice during harvesting. This method is the cheapest and easiest way of preparing the land for the next cultivation season. Burning straw is done to eliminate pests, weeds and diseases (Rosmiza et al., 2014; MADA, 2004; Zhang & Jenkins, 2004). Greenhouse gases (GHGs) such as carbon monoxide, carbon dioxide, sulphur dioxide, nitrous oxide, dust and particulate matter are emitted by burning straw (Ministry of Economic Affairs, 2013; Bhattacharya, 2012; Gupta et al., 2004). It contributes, therefore, to environmental pollution problems that threaten global climate change (Bhattacharya, 2012; Indian Agricultural Research Institute, 2012; Vianaa et al.; 2008; Gupta et al., 2004). The heat also has an effect on the soil surface and soil fertility (Gupta et al., 2004); and human respiratory disease (Henderick & Williams, 2000). Incomplete straw combustion produces carbon monoxide and carcinogenic hydrocarbons which could perhaps cause cancer (Bijay-Singh et al., 2008; Henderick & Williams, 2000).

Its various and enormous potential in industrial development and alternative energy sources is a massive loss if straw is not being better utilised and exploited. A smart economy should be introduced effectively to minimise the straw waste and re-use straw as a resource. Shifting from straw open-burning and traditional straw management to agribusiness development, however, tends to be a challenging economically, agronomic and environmental practice for straw disposal. To build-up the industrial chain with other sectors seems the most profitable agribusiness development. The 'waste-to-wealth' concept may provide a better environmentally-friendly approach for straw disposal and increased eco-efficiency. Thus, a growing body of research seeks to analyse the barriers and challenges of entrepreneurs to utilising and developing straw in their agribusiness.

According to Pastakia (1998), entrepreneurs often have problems in creating demand for the use of green products. Consumer resistance and trust of them using products such as agricultural inputs, technology, consumption pattern, and lifestyle. Unless, the green products convince them through appropriate pricing, high quality, uniqueness, and convenience.

Challenges also arise from restrictive legal environments; absence of a regulations; lack of incentives (Zhang & Jenkins, 2004; Keogh & Polonsky, 1998); educating the potential users (Ahammad & Syed Moudud-ul-Huq, 2013). Dealing with this, entrepreneurs should change their marketing strategy of the concept, in impressing potential users with the innovation and experimention and highlighting the economic benefits. Furthermore, using perhaps cultural symbols in the design of the packaging and mobilising the energies of socio-religious movements while dealing with systemic change (Pastakia, 1998). These could become a key competent for more sustainable entrepreneurship.

2. Research methodology

The study was designed to combine qualitative and quantitative approaches.

To overcome the complementary result, primary and secondary data are used. Triangulation technique (interview, survey and observation) was employed to ensure greater confidence in the findings (Othman, 2007). In-depth interviews and surveys by using semi-structured questionnaire were conducted for data collection.

Studies were carried out with entrepreneurs using rice straw as a raw material in their business. A sample of 24 entrepreneurs was conveniently chosen from the MADA region, Kedah and 20 entrepreneurs in Sekinchan. Sekinchan is located in the Integrated Agricultural Development Area (IADA) North-West Selangor. There are two of the granary areas in Malaysia. The sample emerged from searching websites and from reccommendations made by entrepeneurs already identified.

3. Results and discussion

3.1 The challenges in straw agribusiness development

This study consists of seven types of enterprises offering a wide range of different agribusiness given a wider understanding of constraints and challenges that require addressing (Table 1). Several indicators were identified which affected entrepreneurs' success in developing straw in agribusiness (Table 2).

Table 1. Type of enterprise using straw as raw material in agribusiness development

Type of enterprise	MADA region, Kedah		Sekinchan, Selangor	
	Frequency (n=24)	Percentage (%)	Frequency (n=20)	Percentage (%)
Livestock feed	9	37.5	6	30.0
Compost	6	25.0	9	45.0
Craft paper making	4	16.6	-	-
Mushroom growth medium	3	12.5	3	15.0
Power plant energy	1	4.2	-	-
Nursery mat	1	4.2	1	5.0
Erosion control mat	-	-	1	5.0

Table 2. Entrepreneurs' barriers and challenges in straw agribusiness development

The challenges in straw agribusiness development	MADA region, Kedah (n=24)		Sekinchan, Selangor (n=20)	
	Yes (%)	No (%)	Yes (%)	No (%)
Less support from institutions	20 (83.3)	4 (16.7)	14 (70.0)	6 (30.0)
Lack of community support	19 (79.2)	5 (20.8)	18 (90.0)	2 (10.0)
Lack of research and access to technology facilities	17 (70.8)	7 (29.2)	17 (85.0)	3 (15.0)
Lack of skills and knowledge	14 (58.3)	10 (41.7)	16 (80.0)	4 (20.0)
Lack of capital	13 (54.2)	11 (45.8)	13 (65.0)	7 (35.0)
Entrepreneurial attitude	10 (41.7)	14 (58.3)	11 (55.0)	9 (45.0)
Limited product in the market	9 (37.5)	15 (62.5)	10 (50.0)	10 (50.0)
Continuous supplying raw material	5 (20.8)	19 (79.2)	5 (25.0)	15 (75.0)
Lack of skilled workers	4 (16.7)	20 (83.3)	3 (15.0)	17 (85.0)

3.1.1 Less support from institutions

Institutions play a crucial role in enforced policies; improving technology; generating investment; erecting infrastructure; promoting and marketing the product (Lee et al., 2013). Government policies could significantly affect entrepreneurship development by changing the existing rules and regulation in different institutional environments (Lee et al., 2013). This requires proper documentation and systematic strategies. Strong support services could strengthen supply and demand for straw by-product.

Most entrepreneurs strongly agree that poor support services from government institutions or appropriate authorities is the key point regarding the stagnation in straw agribusiness. This was stated by 83.3% entrepreneurs in the MADA region and 70.0% in the Sekinchan (Table 2). Institutions have currently seen the development of straw as a small effort to reduce straw open burning, air pollution and reduce the cost of field management. Policy in straw management and utilisation of straw only exists indirectly, because of the main agricultural by-products policy relating to palm oil and rubber. Therefore, only small amounts are of support disbursed by the government for straw development. In addition, poorly trained officers are often guiding entrepreneurs to improve product quality; and weak promotions from institutions also have a widespread effect on straw by-products in the market.

3.1.2 Lack of community support

Interviews revealed that community support is very important in increasing and continuing the demand for straw products. In addition to the weakness of institutional promotion, the potential and advantages of using straw by-products are not being effectively communicated to the consumer. Interviews also revealed a community lack of awareness and sensitivity to environmentally-friendly products. This is strongly agreed by the 19 respondents (79.2%) in the MADA region and 18 respondents (90.0%) in Sekinchan. Lack of demand has led to the straw by-products market growing slowly.

According to compost entrepreneurs, most farmers do not know the potential and advantages of using straw compost compared to chemical fertilizer. For example, many farmers still use chemical fertilizer in running agricultural activities even though straw compost proved greater in stabilizing soil structure; storing and recycling nutrients; encouraging micro-organisms' activity; and enhancing agronomic productivity particularly in the long term (Lal, 2005; Matsumura et al., 2005). Chemical fertilizer is also obtained much more easily in the market than straw compost.

All craft entreprenuers strongly agree that straw craft only attracts urban communities instead of rural communities. Rural communities assume that straw craft is not unique because it is produced from crop residue around their neighbourhood. However, in urban communities, straw craft products only receive attention among the elite, hotel industry and shopping malls as a craft decoration. However, straw craft products experience high demand from foreign markets because they are more aware and appreciative of environmentally-friendly products. Therefore, it is not surprising that straw craft products seem to have a more favorable market overseas than locally.

3.1.3 Lack of research and access to technology facilities

The evidence shows that lack of research and inabilitity to access technological facilities are currently the challenges to success in the straw by-product business. This is recognized by 70.8% of entrepreneurs in the MADA region and 85.0% in Sekinchan (Table 2). Interviews with compost entrepreneurs stated that straw compost produced manually takes at least three months to decay. Straw should be turned upside down regularly and the reverse process is very hard. Furthermore, the temperature needs to very hot; up to 70°C for the occurrence of urea process combustion. This could therefore be burdensome for workers to produce straw compost manually.

Poor research into straw quality makes it impossible for straw craft products to compete with other products locally. Straw paper products such as paper bags, gift wrapping and key chains are easily torn when wet. Consequently, entrepreneurs lose their products' demand due to poor innovation.

Demand for straw as cattle feed is also hardly improved. Straw is given as a supplement because of its high fiber, but, less for its mineral content for the cattle's growth (Rosmiza et al., 2014; Devendra, 1989). In fact, research and development into straw as a substrate in mushroom cultivation also needs more improvement. Interviews with a mushroom entrepreneur revealed that based on her experience, imported straw from Thailand produced a better quality mushroom than local straw.

This may be due to the use of chemical fertilizers and pesticides during rice cultivation. The chemicals in rice straw had effects on mushroom cultivation. This contrasted with farmers in Thailand who are practising more organic farming. Importing straw could increase the cultivation cost even though straw could be found easily and cheaply around the local granary area.

3.1.4 Lack of skills and knowledge

Interviews revealed that entrepreneurs gain the basic skills and knowledge of running straw as an agribusiness from three approaches. These are institutions; informal learning through friends and experiences; and existing knowledge. The institutions involved are MADA, State Departments of Agriculture, Malaysian Handicraft Development Corporation Kedah branch, State Veterinary Department and others. Institutions provide workshops of successfull entrepreneurial, processing techniques and production and social development programmes to create dynamic and competitive entrepreneurs. Interviews found that, all entrepreneurs had received advice and attended courses and seminars organized by these institutions. Several entrepreneurs had also obtained machinery, workshops and sheds. However, entrepreneurs reported that they still felt less confident to compete in the market. They still need continuous advice and more appropriate training from institutions.

Gaining skills and creativity, the institutions also provide tours and exibitions for craft entrepreneurs in local and international locations such as the Philippines, Hong Kong and Indonesia. According to the craft entrepreneurs, participation in this programme is very effective in boosting knowledge, sharing ideas and creativity and creating new innovations in processing techniques of straw craft products. In fact, it is a promotional opportunity to create business networks both locally and internationally. One of the craft entrepreneurs stated that demand for her product became more widespread in many countries and her business income increased fourfold after participating in the international exibition.

3.1.5 Entrepreneurial attitude

Interviews also identified entrepreneurs uninformed in developing straw business as another factor that led to stagnation in straw agribusiness development. They do not aggressively promote straw products individually, but often rely instead on financial support and the promotion from the government.

Observation shows that entrepreneurs are less willing to enter new markets, especially locally in Malaysia. They prefer to continue to produce the same product. So, the straw craft market can be seen to be limited locally to a certain community only. Entrepreneurs seem not to be looking for variety in greatly enlarging the market. As a result, their business profitability is decreased.

One craft entrepreneur stated that entrepreneur's age also causes them to be less creative in contributing product ideas and design. They are not sensitive in designing for the current needs. Their ideas, such as key chains and catchphrases, are common and already widely available in the market. Young entrepreneurs are more advanced in shaping new ideas and product design. Young entrepreneurs also informed about latest innovations and design through the internet and reading. Only a few entrepreneurs stated that they are unconfident to penetrate international markets due to language problems (especially English language) in communicating with foreign investors.

However, interviews presume that three entrepreneurs have a vision and are highly motivated to improve their business. They took their own initiatives abroad to such places as Singapore, Indonesia, Thailand and California, in the United States. They learned how the straw industry can become well-developed through the ideas, processing techniques, designs and creativity from successfull entrepreneurs.

3.1.6 Limited product in the market

Findings also show that limited design and products in the straw market have also affected the development of straw agribusiness. It is only recognized by 37.5% of entrepreneurs in the MADA region and 50.0% in the Sekinchan (Table 2). The observation revealed that straw craft products suffer from a shortage of ideas and are more focused on a particular community and religion. All craft entrepreneurs produce the same product such as Malay wedding stuff box, Islamic calligraphy and keychain. Hence, the market will be limited and not widespread amongst the various races in Malaysia. Products also do not attract demand from rural communities and failed to impress the corporate sector. This could in turn affect market performance outcomes.

3.1.7 Continuous supplying of straw raw material

Interviews revealed that the supply of straw raw material does not greatly affect straw agribusiness. This was strongly agreed by 79.2% of entrepreneurs in the MADA region and 75.0% in the Sekinchan (Table 2). Straw is widely available throughout the Kedah and Sekinchan areas. It is available two seasons per year and a continuous suppy from straw storage is provided by the institution.

For example, in the MADA region, most entrepreneurs get their straw from the District Farmer's Organisation or *Pertubuhan Peladang Kawasan* (PPK). The price for a straw bale weighing 145 kg is RM80 (*Malaysian Ringgit*) including delivery and RM70 without delivery. However, a few entrepreneurs sometimes face the problem of getting sufficient quantities of straw supplies to run their business. This is because the storage nearby is insufficient to meet the demand for animal feeding, compost and other uses from local and other areas. Therefore, *PPK* is attempting to get the straw in other areas, which are located some distance away. This situation would affect the straw agribusiness development. However, most livestock entrepreneurs also act as farmers, getting a straw supply for livestock feeding from their own fields.

Interviews revealed that craft entrepreneurs use only small quantities of straw. Usually, they get their own straw supply from a farmer at a lower price between 50 cents to RM2.00 per sack and sometimes free. This is because farmers consider straw as a residue which needs to be cleared-up for another season. Therefore, the production cost could be saved.

3.1.8 Lack of capital

As a new venture lacking extensive experience in business, entrepreneurs face hindrances to accessing loans and financing from institutions. Therefore, more than half of the entrepreneurs in the study area face shortage of capital to expand their straw business (Table 2). Capital investment and recovery does not happen in the short term, as demand can be too slow in the market. Furthermore, the craft is not a daily consumer product and the demand is intermittent. Due to difficulties in accessing credit, they use their own capital and thus it takes more time to achieve profitability. This situation could stagnant their business.

One craft entrepreneur stated that innovation requires further technology and more materials. The cost of production increased due to using a new technique such as marbling and '*batik canting*'. These innovations employ laser techniques and high quality use of colours. To make the straw products more valuable, packaging materials must be more attractive. For the global market, straw craft products require a high quality of packaging to prevent damage. Interviews revealed that lack of capital restricts the entrepreneurs' ability to compete in the global market. Based on craft entrepreneurs' experiences, shipping with poor quality packaging led to product damage. Clients lost confidence and entrepreneurs suffered losses. He also noted that export demand usually involved enormous capacity, requiring a minimum 5000 to 10,000 straw crafts a month over a three year period. Instead of dealing with the high cost of packaging, shipping and export taxes, entrepreneurs only focused on the local market with a small scale business.

For a compost and livestock enterprise, capital is needed to build proper wide area straw storage with a roof. Sensitivity to humidity makes straw mould easily when exposed to dew and rain (Rosmiza et al., 2014). Lack of capital for providing basic facilities has affected entrepreneurs' ability to expand their straw agribusiness.

3.1.9 Lack of skilled workers

Results indicate that entrepreneurs never have a problem in getting permanent or even part-time workers. This was recognized by 83.3% entrepreneurs in the MADA region and 85.0% in Sekinchan (Table 2). Usually, local labour comes from secondary school leavers and houseviwes. Craft entrepreneurs stated that they have difficulty obtaining skilled workers. Most temporary workers are housewives, just gaining an extra income. They lack skills and ideas; have a low quality of work; are not efficient in terms of production; and have no initiative to improve theirselves by attending skills courses. As a result, the end product seems of poor quality - unattractive; untidy and unable to fulfill the orders. Customers are initially not confident in their products and entrepeneurs bear the loss of cancelling the orders.

4. Conclusion

This research revealed that entrepreneurs struggle to expand their business especially due to lack of support from the government and public; research and innovation, and available capital and skilled workers. Entrepreneurs are characteristic as well in their constraints to understand the opportunities and potential of developing value chains on

domestic and international market needs. The crucial barriers and challenges in straw agribusiness development are on on-field and off-field uses, and developing market driven economically viable straw products.
Reaching entrepreneurship in a sustainable context requires a more efficient approach and strategies from institutions; capital markets for finance and investment; stakeholder and community support; and changes of entrepreneurs themselves.

Important amongst these issues, entrepreneurs should build their ability with regard to more sustainable entrepreneurial opportunities and take advantage of institutional incentives to become more fruitfully sustainable entrepreneurs. Well-planned strategies and programmes that provide effective inputs should enhance community and global awareness about the green products on the market. This would then increase greater straw by-product demand in the market.

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