

Local Knowledge as the Basis of Innovation in Managing Agricultural Products

**Jurry Foo¹, Muhammad Yasar², Mansoor Abdul Hamid³, Diana Demiyah Binti Mohd Hamdan⁴,
Harifah Mohd Noor¹, Jalihah Md. Shah⁵, Kee Sabariah Kee Yusof⁶, Intan Soliha Ibrahim⁷, Marja
Azlima Omar⁸, Pauline Yong⁵, Colonius Atang¹, Hanif Abdurahman Siswanto⁹**

¹Geography Program, Faculty of Social Sciences and Humanities, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, Malaysia.

²Agricultural Engineering Department, Faculty of Agriculture, Universitas Syiah Kuala, Jalan Tgk. Hasan Krueng Kalee 3, Darussalam-Banda Aceh 23111, Indonesia.

³Food Technology & Bioprocess Program, School of Food Science & Nutrition, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, Malaysia.

⁴Environmental Science Programme, Faculty of Science and Natural Resources, Universiti Malaysia Sabah, Malaysia.

⁵Sociology and Anthropology Program, Faculty of Social Sciences and Humanities, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, Malaysia

⁶Industrial Relation Program, Faculty of Social Sciences and Humanities, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, Malaysia

⁷Communication Program, Faculty of Social Sciences and Humanities, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, Malaysia

⁸International Relation Program, Faculty of Social Sciences and Humanities, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, Malaysia

⁹Centre for Policy Research and International Studies, Universiti Sains Malaysia, Jalan Ilmu, 11700 Gelugor, Pulau Pinang, Malaysia

*E-mail: jurryfm@ums.edu.my, yasar@unsyiah.ac.id, chot@ums.edu.my,
diana.demiyah@ums.edu.my, harifah@ums.edu.my, jalihah@ums.edu.my,
keesabariah@ums.edu.my, intansoliha.ibrahim@ums.edu.my, marja@ums.edu.my,
pauliney@ums.edu.my, colonius@ums.edu.my, hanifsiswanto@student.usm.my*

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Abstract

*The management of agricultural resources is an important agenda especially during the period of COVID-19 pandemic, which has increased food waste from agricultural products and the loss of sources of income among communities involved in agricultural activities. However, food waste remains as an urgent matter even in post-COVID-19 pandemic. This article aims to discuss about how local knowledge is used to deal with the agriculture waste. Vegetables dumping issues causing waste and affecting the income of farmers and vegetable sellers. Therefore, innovations in processing vegetables into processed food was implemented to optimize agribusiness values. In achieving this goal, the steps to be taken are to empower the existing knowledge so called 'local knowledge'. The information in producing this article was gathered through observation of community who participate voluntarily and interviews with Department of Agriculture, Federal Agricultural Marketing Authority (FAMA) and The Ministry of Agriculture and Food Industries and abbreviated (MAFI). The results of the study found that the main methods of food processing method by the community are preserving, drying, smoking or curing and frying. Hence these methods were used to process cabbage (*Brassica oleracea*) into several products namely (1) cabbage floss, (2) salted cabbage, (4) cabbage bosou and (4) cabbage kimchi.*

Keywords: *Local Knowledge, Agriculture Produce, Post-COVID-19, Food Product*

INTRODUCTION

The management of agricultural resources is an important agenda especially during the period of COVID-19 pandemic, which has caused a social disaster for the community in general when the communities who involved in agricultural activities loss the sources of their income. The inability to sell agricultural products causes the rising wastage of vegetables and this will disrupt the agricultural product's market chain. However, food waste remains as an urgent matter even in post-COVID-19 pandemic. Hence, it is always important to look for an initiative that can be used to manage the food waste.

During the COVID-19 pandemic period, the community in Ranau district, Sabah Malaysia faced this social disaster. Therefore, the proposal to optimize local knowledge as a basis in innovating agricultural resources was proposed as one of the alternative measures, especially to reduce the risk of dumping and waste of vegetables. The idea of using local knowledge to manage agricultural resources materialises by taking into account the capacity and ability of the community, which refers to the available resources and the knowledge and skills of food processing that the community is involved in.

Innovation

Innovation has become a necessity for all contemporary enterprises that want to survive in a world characterized by competition, technological changes, and dynamicity (Adam & Alarifi, 2021; Hendrayanti & Nurauliya, 2021). Innovation is the act of modifying ideas, subjects or objects that benefit humans as consumers, while local knowledge refers to the knowledge and skills mastered by a community or society on a local scale using their own creativity (Noer, 2021). The general opinion is that innovation is the act of modifying or producing something that can be seen with the naked eye. However, the interpretation of innovation not only descends to the production of things but with the keywords 'modify', 'solution' and 'useful',

innovation can be interpreted as ‘ideas’ or ‘goods’ that can be used by humans in solving an issue or problem as shown in figure 1.

The main force of innovation practices in enterprises is the ambition to seek replacements in the form of better performance (Adam & Alarifi, 2021). Social innovation descends to the aspects of resources, operating costs and increasing productivity which leads to a positive impact for the community, especially in terms of improving the quality of life (Ismail *et al.*, 2017). From an academic perspective, innovation is interpreted as knowledge innovation, technological innovation and social innovation, which involve the transfer of expertise and research findings or applied by the community towards achieving improved wellbeing and socio-economic status (Komoo, 2015).

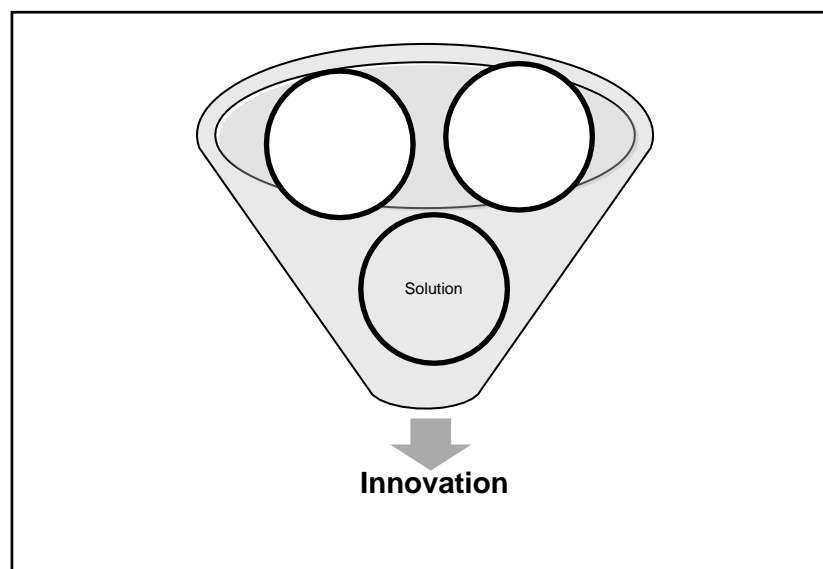


Figure 1: Principles of innovation

The advent of Industrial Revolution 4.0 (IR4.0) has created global challenges and changes and a diversity of innovations, where such innovations are hidden instead of progressive and sustainable technologies such as products, processes, organizations, and marketing innovations that contribute to changing the public understanding of innovation and its measurements (Schachter, 2018). This means that an innovation is not subjected to goods but to ideas, beneficial to human lives when used in solving problems, improving life, creating job opportunities, income distribution, economic growth, and alleviation of people from poverty (Aulia, Saragi & Simbolon, 2021).

Local knowledge

Local knowledge governed the fundamental aspects of daily life. It refers to the understandings, skills, and philosophies that societies with a long history of interaction with their natural environments (UNESCO, 2021). Resource management requires accurate knowledge (Rostam & Ahmad, 2006). Local knowledge means of the same place (*local*) and also knowledge (Salleh & Ramli, 2020). The key word for local knowledge is knowledge and

skills possessed and practised by a group of people who live together in a place. Knowledge is knowledge that is mastered and seen through daily practice as seen in figure 2. Knowledge is information that is used as a reference, guidance, or guide for the formation of human behaviour (Othman, 2011). It guides elements of traditional culture based on human life with society related to human resources, culture, economy, security, and law (Yusri and Anuar, 2020).

Referring to the Convention on Biological Diversity (CBD), local knowledge is the cumulative result of knowledge and beliefs that can be obtained through the method of hereditary inheritance and human relations in life, including human relations with the natural environment. Local knowledge can influence the preservation of the environment (Sintian *et al.*, 2018) as local knowledge is also related to human relations and its natural environment, thus it follows that local knowledge can influence the use of resources in human life.

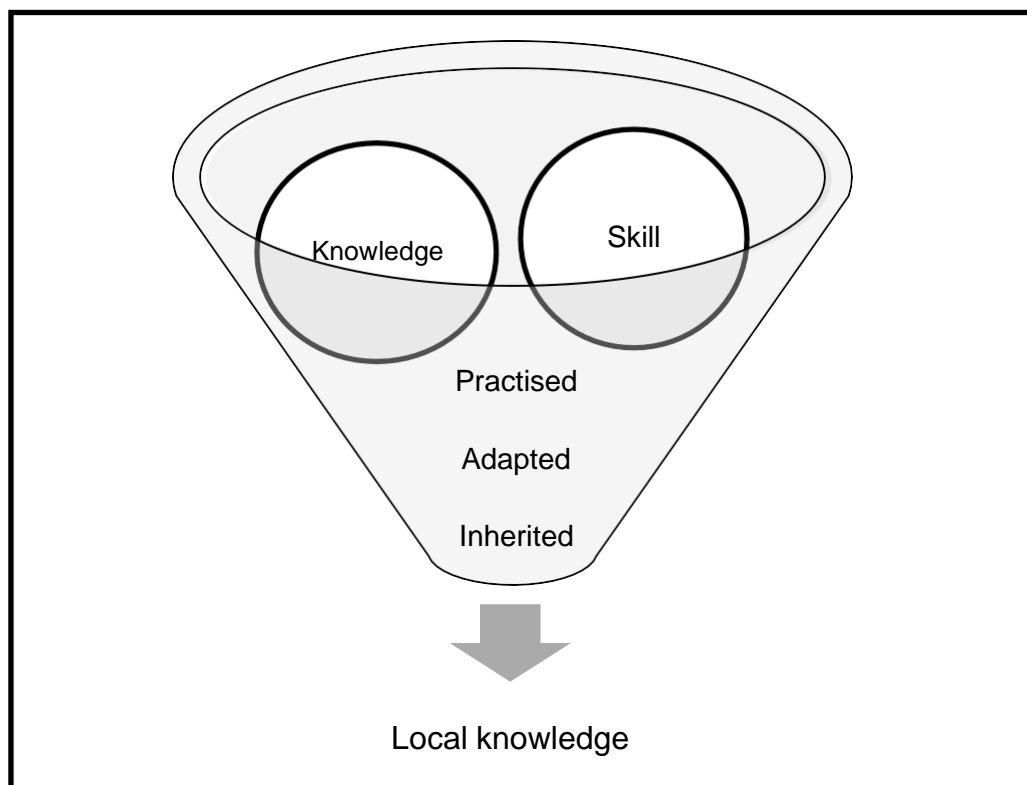


Figure 2: Local knowledge

RESEARCH METHODS

The research was conducted in qualitative approach. In collecting the qualitative data, the researchers collected the data through several methods which are field observation and interview sessions. Field observation was applied to allow the researchers view the initiative of the local community at Ranau, Sabah Malaysia in producing food products from agricultural food waste. There were 3 local entrepreneurs from the community at Ranau who voluntarily participated to be observed. The activities were then recorded to obtain information about the potential of the products they produced. Apart from that, interviews with the Department

of Agriculture, Federal Agricultural Marketing Authority (FAMA) and The Ministry of Agriculture and Food Industries and abbreviated (MAFI) were conducted to gain insight into the quality and potential of products produced based on Brassica sp. In addition, consumer's view and feedback were also collected to find out the public's acceptance of those products. Through this, researchers will understand the competency of the local products to be marketized in local markets.

RESULTS AND DISCUSSION

Ranau is well known as a production centre for various agricultural and food products, especially those involved as entrepreneurs under the guidance of the Department of Agriculture. In addition, many traditional food products have been appointed as products such as Tuhau floss, bosou (*pickled rice*) and Tuhau pickle which are produced using local knowledge that was inherited or adapted. Among the main methods of food processing are preserving, drying, smoking or curing and frying as seen in figure 3. Basically, food is processed so that it is more lasting and can be stored for a longer period as a guarantee of food supply. Today, food processing is largely adapted from foreign cultures and influenced by lifestyle and the development of media technology.

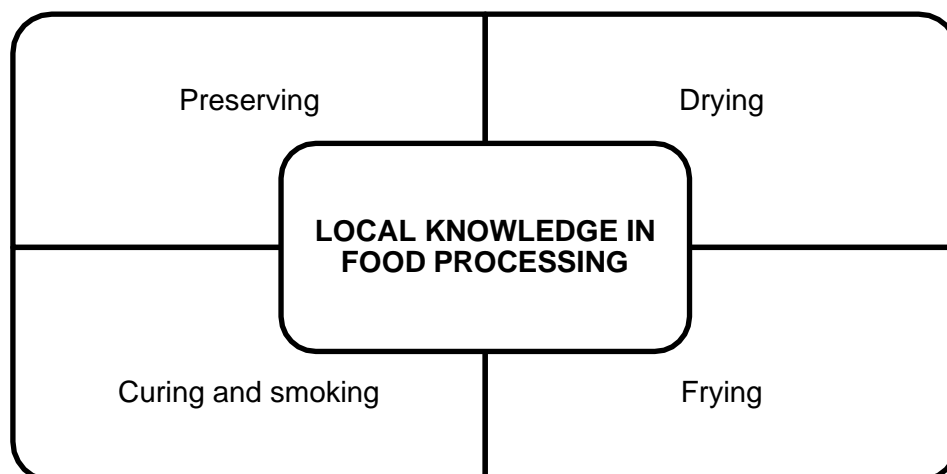


Figure 3: Community local knowledge in food processing

Preserving

Preserving is the most popular process in Ranau, Sabah. This is most likely due to its placement in the rural areas and requires more effective food storage techniques, while waiting to get food supplies in the next *tamu* (community market). The process of preserving the traditional way usually requires salt and *Pangi* fruit, that is the *kepayang* (*Pangium edule*) as shown in figure 4 which acts as an organic preservative. Preserved foods are named as '*Bosou*' or '*Tonsom*'. The items that are always preserved consists of plant and animal sources, in particular river fish and hunted meat. The example of fish product which processed with preserving category is Fish *bosou* as shown in figure 5. While fruits such as *Bambangan* (*Mangifera pajang*) is pickled with its grated seeds without using *Pangi*.



Figure 4: *Pangium edule*



Figure 5: *Fish bosou*

Drying

'Kinoring' is food produced through the drying process. Drying is usually done to remove water content in fish and meat so that they are not easily spoiled or mouldy and can be stored longer. In addition, the dried items are also side dishes such as *Kodoroi* leaves, chalk from the shells of *shellfish* and *Sigup (Nicotiana sp.)*. Meanwhile, dried medicine is based on flora and fauna including roots and foliage, bark and parts of animal that are considered potent as medicine. Plant-based preservatives that are dried are *Sasad* (yeast from rice) and *Pangi*.

Frying

Frying is the process of drying raw items using oil. The items for the frying process have long been adapted in the Dusun community. Frying plant sources such as Tuhau and Torch Ginger Flowers started from a food production project carried out by the community under the guidance of the Sabah State Department of Agriculture and the Malaysian Agricultural Research and Development Centre (MARDI).

Smoking and curing

Smoking and curing are processes referred to as 'Sinalau'; in the Dusun language of Ranau. This process is usually done on hunted meat and occasionally on livestock meat. It not only removes the fishy smell from the meat but avoids it from quickly rotting or getting spoiled. In the traditional practice, every kitchen has a hake for smoking meat or fish.

CABBAGE-BASED INNOVATIVE FOODS USING LOCAL KNOWLEDGE

While experiencing vegetable dumping as a result of not being able to sell, the initiative was taken to introduce cabbage-based recipes (*Brassica oleracea*) using local knowledge. The result is processed food products (1) cabbage floss, (2) salted cabbage, (4) cabbage bosou and (4) cabbage kimchi as shown in figure 6.

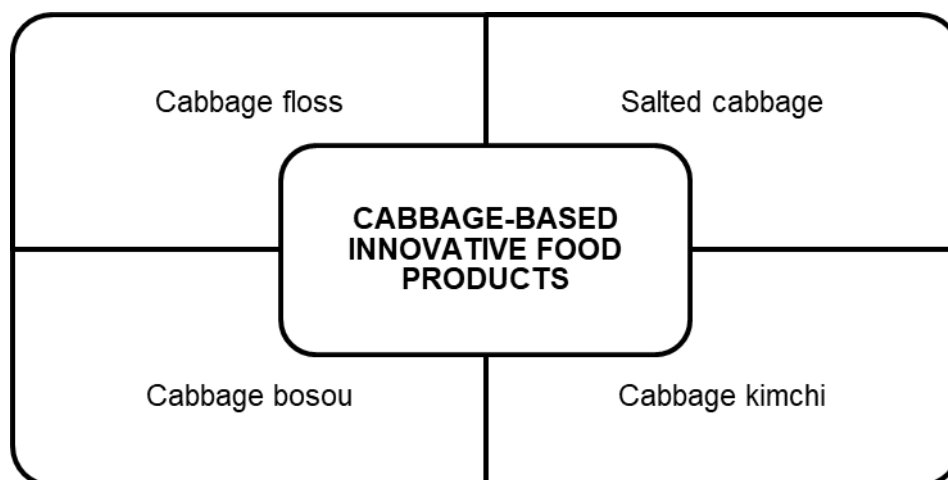


Figure 6: Cabbage-based innovative food products

Cabbage Floss

Cabbage Floss as seen in figure 7 is a product that is produced using the frying method. Finely sliced cabbage is mixed with seasonings as desired and fried in plenty of oil until it turns a golden colour and completely dried. Cabbage floss can be eaten as a snack or side dish along with rice.



Figure 7: Cabbage Floss

Salted cabbage

Salted round cabbage in figure 8 or known as 'Hamchoi' is a food product preserved using rice water and salt. The original recipe is to use Napa cabbage.



Figure 8: Salted round cabbage

Cabbage Bosou

Cabbage is processed into pickles for preservation purposes to make them last longer as in figure 9. Usually, the technique of producing bosou is to use rice, salt and *Pangium edule* as a preservative, which is similar as how the local community preserve other type of food.



Figure 9: Cabbage Bosou

Cabbage Kimchi

Cabbage kimchi in figure 10 is adapted from the traditional food of Korea. In recent years, kimchi has become a favourite side dish in the menu of the community as a result of the influence of K-POP evolution that is spread through media channels and the ability to travel to Korea.



Figure 10: Cabbage kimchi with white pepper

BENEFITS OF FOOD INNOVATION TO THE COMMUNITY

Cabbage-based food innovation by optimizing local knowledge has benefited community livelihoods including reducing the risk of cabbage wastage, the existence of a variety of cabbage-based products, business opportunities and income opportunities. The result of this creativity will increase the ability and resilience of the community in facing the dynamicity of the social world.

Reduce the risk of wasting cabbage

The more choices of recipes and alternative menus using cabbage, the higher the demand for that vegetable, especially when it is able to be processed as a long-lasting food and has a flavour that meets the tastes of local and non-local consumers.

Product diversity

Cabbage-based food innovation adds to the potential to diversify food products not only to meet domestic demands but also potentially be adopted as a food-based tourism product. This is because the name 'cabbage' itself is often associated with the Ranau district.

Business Opportunities

The existence of the product allows for business opportunities. The production of cabbage-based food products has been in demand not only in the Ranau district and around the state of Sabah, but also in peninsular Malaysia. This shows its potential as a food that meets the tastes of various layers of society.

Income opportunities

The efforts to produce cabbage-based food products and their marketing have opened up new business opportunities and thus contribute to the income of the community. This is because this new business ecosystem provides job opportunities as kitchen assistants and in the processing, packaging and subsequently delivery sectors. In fact, it has opened up opportunities for digital merchants to become agents and distributors of these products, for example on the Lazada and Shopee platforms as well as through Facebook and other social media. Figure 11 shows the example of the community's products being sell using online platforms.

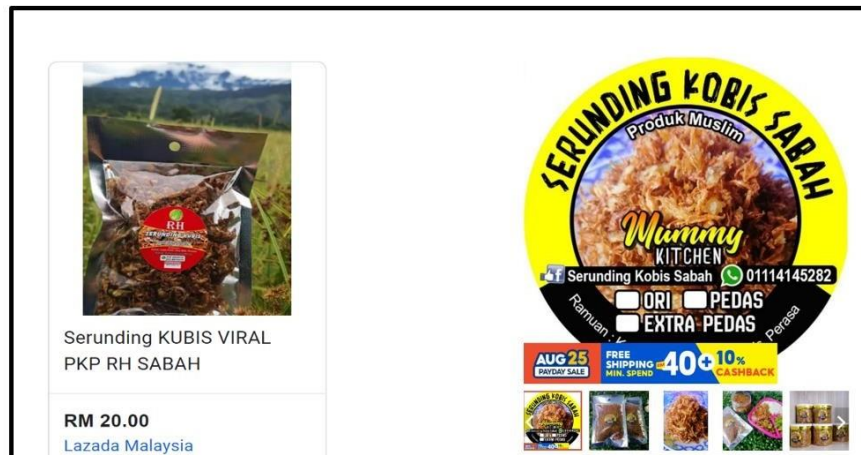


Figure 11: Online Sales

CONCLUSION

Openness and willingness to change is an action that needs to be taken and implemented in every member of society for survival. The problem of vegetable dumping should not be seen as a trivial matter because it will be a loss to various parties. Therefore, innovations to diversify the methods of processing vegetables need to be thought and implemented to optimize their value and usefulness. In achieving this goal, the steps to be taken are to empower the existing knowledge and skills in the community. Whereas for the long-term management of resources wisely, the optimization of local knowledge and the development of better-quality products should be planned more proactively.

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