

# Development of local agriculture and raising the level of community products with BCG economy model: Case study Bueng Niam subdistrict, Mueang district, Khon Kaen

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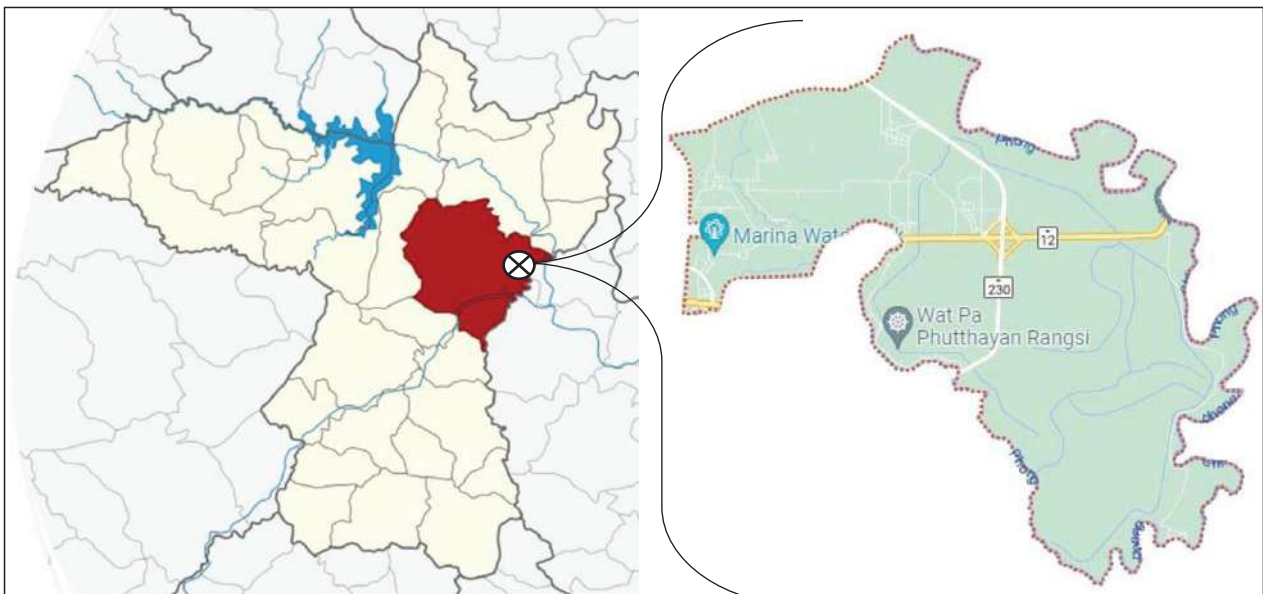
**Abstract** - The economy of Bueng Niam sub-district depends on the agricultural sector. From analyzing the environment and community potential using strengths, weaknesses, opportunities and obstacles (SWOT Analysis) it was found that farmers still lack knowledge on raising agricultural plots to standards. Good Agricultural Practice: GAP) and have a value attitude towards the use of chemicals to increase agricultural productivity. Lack of grouping for use as production planning information Most gimmicks and profits are concentrated in the middle class. The majority of farmers are elderly individuals who require labor in the agricultural sector. Under the concept of leadership bio economy circular economy and the green economy (Bio-Circular-Green Economy) are applied in developing and upgrading local agriculture and community products. Through a variety of activities, the university acts as an academic resource for network partners to develop area-appropriate knowledge. Through the University to Community (U2T) project's mechanism for employers to develop further for interested farmers, prototypes are created. Application of Bueng Niam for Agricultural Community Management and Intelligent Greenhouses. For the new generation of young people who prefer to develop and solve community issues using technology.

The results of utilizing the Bueng Niam application can create agricultural security and enhance the strengthen. By assisting in the development of planning, marketing, and labor recruitment procedures in the region. And encourage youth to learn how to use intelligent greenhouse technology to systematically improve the quality of GAP-compliant food crop production.

**Keywords:** BCG economy, Bueng Niam

## 1. Origin and significance

Bueng Niam Subdistrict is located in the east of Mueang Khon Kaen District. Bueng Niam Sub-district has a total area of 25,770.625 rai (41.233 square kilometers), about 12 kilometers from Khon Kaen, with natural water sources such as Nam Phong, Huai Phra Khue, Huai Khum Din, and Bueng Om Kaeo, and water sources by humen made include are NongSom Kung, Bueng Yai, Bueng Khin Nam, Nong Sa, Nong Hu, Nong Wai and irrigation canals cover 95% of the cultivated area, receiving irrigation water from Nong Wai Reservoir. Most of the people are mainly engaged in agriculture. The economic condition of Bueng Niam sub-district depends on agriculture. The major crops are rice and vegetables (Bueng Niam subdistrict Municipality, 2016 ; Muang District Community Development Office Khon Kaen Province, 2018).



**Figure 1.** Bueng Niam District Map Mueang Khon Kaen District Khon Kaen

The field survey of basic information revealed that farmers lack knowledge in agriculture according to the requirements of GAP standards, and that the use of chemicals to boost agricultural productivity is widespread. absence of grouping information for production planning Most gimmicks and profits are concentrated in the Middleman. The majority of farmers are elderly. There is demand in the agricultural sector. Therefore, the research team presented the concept of bio economy circular economy and the green economy (Bio-Circular-Green Economy: BCG Economy) as applied to the development of local agriculture in order to solve problems and increase the level of community products. Mueang Khon Kaen District Bueng Niam Subdistrict Khon Kaen.

## 2. Objective

Apply the concept of BCG Economy to developing local agriculture and upgrading community products in Bueng Niam Subdistrict, Khon Kaen District Khon Kaen.

### 3. Related theory

#### 3.1 Analysis of a environment and potential

Analysis of environment and potential (SWOT Analysis) is an examination of the circumstances of an organization. or the current organization to identify its strengths, weaknesses, or potential obstacles to achieving the desired condition. The central principle of SWOT is the analysis of the situation from two perspectives, namely the internal and external situations. Therefore, SWOT analysis can be referred to as a situation analysis (Situation Analysis), which is an analysis of strengths and weaknesses to know oneself (know us), the environment (know them) same idiomatic One who knows the enemy and knows himself, and opportunities - obstacles. Analysis of external and internal factors affecting the organization. This helps the management of the organization to be aware of various changes occurring outside the organization. Both what has happened and future trends Including the impact of these changes on the business organization and the strengths, weaknesses and capabilities that the organization has. This information will be very helpful in determining the vision. Strategic formulation and implementation of appropriate corporate-level corporate strategies.

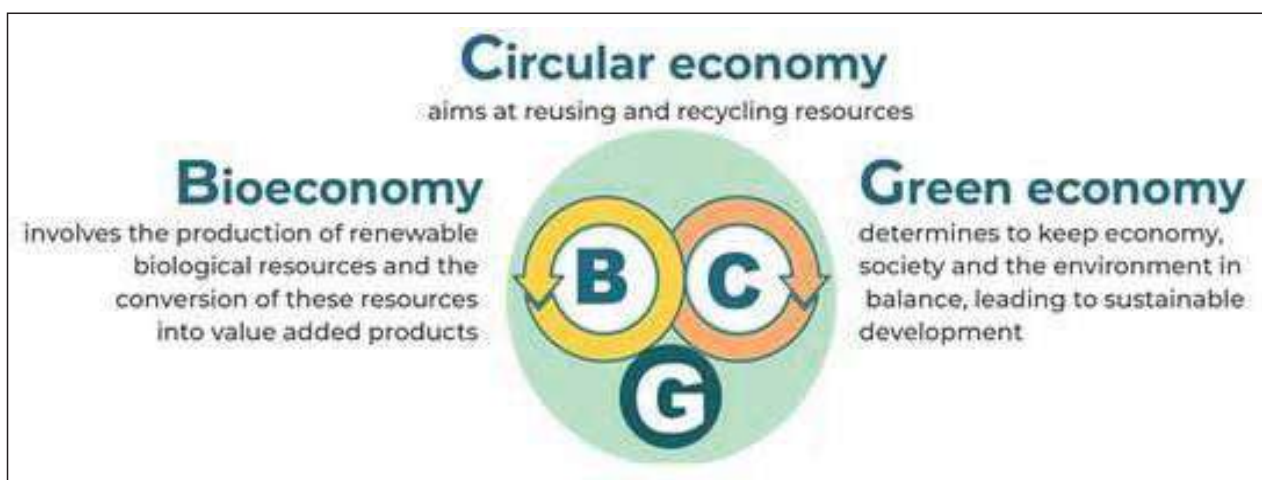
**Table 1** Factors, Environment and Potential analysis

<b>Internal Factors / External Factors</b>	<b>S</b> strengths within the organization	<b>W</b> Weaknesses within the organization
<b>O</b> Outside Opportunities	<b>SO</b> , Take advantage of internal strengths and external opportunities to use	<b>WO</b> Fixing internal weaknesses by considering external opportunities that is good for the organization
<b>T</b> external obstacles	<b>ST</b> Resolving or reducing external barriers by utilizing internal strengths.	<b>WT</b> Fixing or reducing damage arising from weaknesses within the organization and external obstacles

The benefits of SWOT analysis are the analysis of various environments both inside and outside the organization. Each of these factors helps to understand how they influence an organization's performance. An organization's strength will be its internal capabilities that are utilized to achieve its goals. While the weaknesses of the organization will be the internal features. that might destroy the performance Environmental Opportunities are situations that provide an opportunity to achieve organizational goals, on the other hand, environmental barriers are situations that hinder the achievement of organizational goals. The results of this SWOT analysis will be used as a guide to formulate a vision. Strategy for the organization to develop in an appropriate way.

### 3.2 The concept of bioeconomy circular economy and green economy

BCG Economy is economic model for sustainable development It is a concept of science and technology. and innovation to elevate sustainable competitiveness for 4 targeted industries (S-curves), namely agriculture and food industries ; Energy and materials industry Health and medical industry and the tourism and service industries. by science technology And innovation will help increase efficiency for producers who are old production bases such as farmers and communities. as well as encouraging entrepreneurs to produce products and services with high added value or innovation (Mahanakorn Partners Group, 2021 ; Ministry of Higher Education Science, Research and Innovation, 2021 ; Meiksin, 2020).



**Figure 2.** BCG economic model

BCG Model is a mechanism with high potential to comprehensively improve the quality of life of people in the country. It can effectively diversify opportunities and reduce inequality. At the same time, it was able to establish Thailand as a world leader in some areas where Thailand has potential. Therefore, the country's strategic goals have been set for use in driving the BCG Model as follows:

- Economic value added of BCG target industries.
- Reduce inequality by increasing farmer and community income.
- Raise the level of Thai food industry operators to become the world's top 5 producers of healthy food and high-value food ingredients.
- Create and develop bio-industries, pharmaceutical production, medical devices biomaterials to be strengthened potential for export It is a source of high-skilled employment and high income.
- Tourism management system leads to the top 3 of Asia Pacific organized by Travel & Tourism Competitiveness Index, World Economic Forum.
- Reducing resource usage by 2/3 from current.



The principle of operation is the integration of work between various sectors in a unified and dynamic manner. Each sector will adhere to the core principles of jointly driving the BCG Model, with a focus on both global competitiveness and the contribution of community benefits. and driven by a quadruple helix mechanism through the synergy of the private sector, government, academia, civil society, as well as leveraging global cooperation partnerships, by Ministry of Higher Education, Science, Research and Innovation will drive the potential of universities and research institutes.

## 4. How to proceed

### 4.1 Assessment results of environment and community potential

Results from the analysis of the environment and community potential. By using data from the targeted human development data management system (Thai People Map and Analytics Platform: TPMAP) along with a survey of spatial data, can be divided into 2 issues: community context and Guidelines for community development for sustainability by rationalizing both internal and external factors. It consists of strengths, weaknesses, opportunities and threats as shown in Table 2.

**Table 2** Results of the analysis of environment and community potential in Bueng Niam Subdistrict

<b>Environment and Community Potential Bueng Niam Subdistrict</b>	<i>strengths within the community</i>	<i>weaknesses within the community</i>
	<ul style="list-style-type: none"> <li>- abundance of water resources and the availability of irrigation systems</li> <li>- Farmer's expertise in plant and vegetables production</li> <li>- having a social cost and culture</li> </ul>	<ul style="list-style-type: none"> <li>- Agricultural areas have repeated flooding.</li> <li>- Farmers lack of grouping lack of bargaining power and production planning</li> </ul>
<p><i>chance</i></p> <ul style="list-style-type: none"> <li>- The sub-district location is only 12 km from the center of Khon Kaen.</li> <li>- The use of technology to develop the career of farmers.</li> <li>- There is support and promotion of various projects. from the government</li> </ul>	<p><i>Taking advantage of strengths and opportunity to use</i></p> <ul style="list-style-type: none"> <li>- Developing the community to be a model community Using technology to help raise the career of farmers by integrating relevant government agencies to help develop</li> </ul>	<p><i>fixing internal weaknesses by considering the opportunity that is beneficial to the community</i></p> <ul style="list-style-type: none"> <li>- Create a model database of community agriculture data. to assist in production planning</li> <li>- Collecting groups of farmers to raise the level of vegetable plots to travel and online farms.</li> </ul>

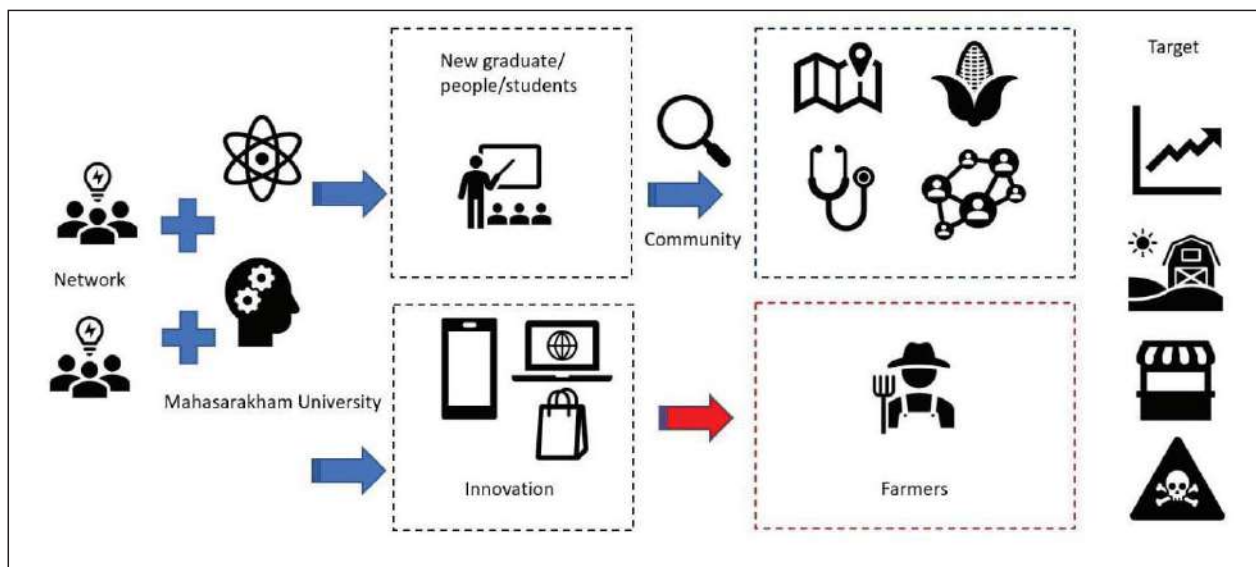
**Table 2** Results of the analysis of environment and community potential in Bueng Niam Subdistrict (cont.)

<i>obstacle</i>	<i>Resolving or reducing external obstacles by using internal strengths</i>	<i>Fixing or reducing damage caused by weaknesses and obstacles</i>
<ul style="list-style-type: none"> <li>- Farmer values to increase productivity</li> <li>- Knowledge for upgrading agricultural products</li> <li>- Most farmers are in old age.</li> </ul>	<ul style="list-style-type: none"> <li>- Educate farmers to raise agricultural productivity with science and technology.</li> <li>- Create a database for management of modern agricultural plots. by bringing social costs community involvement</li> </ul>	<ul style="list-style-type: none"> <li>- Bring modern knowledge to use in community agricultural career management.</li> <li>- Build Community Engagement</li> </ul>

## 4.2 Key activities

Under the concept of bioeconomy circular economy and green economy in developing local agriculture and upgrading community products. Cooperation with universities and government agencies in the area with the concept of self-reliance of the community with the steps to proceed as follows:

1. Field survey and a meeting to discuss collecting data from farmers.
2. Local agency network meeting.
3. Training to provide knowledge on further development guidelines.
  - Logo development workshop.
  - Workshop on upgrading vegetable plots to tourism and online farms.
  - Create a community database and agricultural plots using infographics.
  - Workshop on upgrading vegetable plots to meet GAP standards.
4. Develop a prototype of a smart house.
5. Bueng Niam Application Prototype Development (online marketing / labor marketing / production planning).
6. knowledge transfer to the community.



**Figure 3.** Conceptual Framework

The university acts as an academic and intermediary with various networks to develop knowledge that is suitable for the area through the training of employers in the University to Community (U2T) project so that it can be further developed for farmers. interested in more and develop prototypes Bueng Niam Application and smart greenhouse For the new generation of young people who prefer to use technology to develop and solve community problems. The use of the Bueng Niam Application is considered to create security in the agricultural profession and strengthen the competition for the community. through the process of planning, marketing and recruiting labor in the area Along with encouraging youth to learn how to use smart greenhouse technology to enhance the quality of farmers. Reduce the use of chemicals, aiming to systematically elevate agricultural plots to GAP standards.

### 4.3 Key partners

A key partner in driving ideas under University Cooperation. and government agencies in important areas, consisting of

- Teachers, educational personnel and students of Ban Don Du Kururat Wittaya School and Ban Bueng Niam School, Bueng Kaiunun Tha Hin are mechanisms for transferring the organization to bring knowledge technology to youth.

- Lecturer, Faculty of Science, Architecture, Karma, Urban Planning and Creative Arts to be a mechanism for the development of logos and packaging.

- Lecturer in Environmental Engineering School of Engineering Suranaree University of Technology Personnel Office of Agricultural Research and Development Region 3 Department of Agriculture Ministry of Agriculture and Cooperatives Personnel Bueng Niam Community Health Promotion Hospital come into the mechanism to provide knowledge to raise the quality of farmer plots.

- Village Chief, Village Headman, Bueng Niam Subdistrict, Mueang District, Khon Kaen Province come to help as a mechanism for providing information to link between vulnerable groups and field visits.

#### 4.4 Main target group

##### 1. Target “community” group (Locals Segment)

- Farmers who voluntarily participate in the project Received a training to develop the potential of the symbol market development. Development of boxes and packaging and developing agro-tourism routes ; creating community databases and agricultural plots using infographics.

- Youth groups in Bueng Niam Subdistrict through learning point activities smart house model.

- Vulnerable groups who voluntarily want to earn income from employment.

##### 2. “Customer” target group (Customer Segment)

- The customers are people in Bueng Niam sub-district community and people in Khon Kaen who want agro-tourism.

- Youth groups in Bueng Niam Sub-district who want knowledge of technology to improve their quality of life.

- Farmers who need labor and those who are unemployed and need additional income.

#### 4.5 Applying modern knowledge to manage community agriculture careers

According to the results of the analysis of the environment and community potential, the lack of grouping to be used as information for production planning Most of the mechanism and profits are in the middle class. Most of the farmers are elderly people who need labor in the agricultural sector. The use of technology to solve problems is therefore the approach chosen by the researcher. is a logo development training preparation of databases and agricultural plots ; Bueng Niam application development for online marketing management labor management in the agricultural sector and as information for business production planning and the development of a prototype of a smart home learning point for youth.

##### 1. Relationship with target “community” groups (Locals Relationship)

- Bueng Niam Application serves as a medium for exchanging information of farmers. for decision making in production planning Sales of agricultural products and matching between owners of plots who need labor and contractors. which can be used anywhere and at any time.



## 2. Relationship with target “customer” group (Customer Relationship)

- Farmers have developed logos to indicate farmers’ information. and remember products to promote sales.
- Community database and agricultural plots using infographics and YouTube to introduce farmer information.
- Application acts as a public relations mechanism for agricultural products from the orchard so that interested members can order and specify delivery.

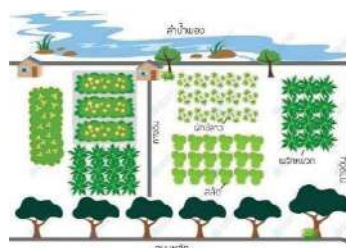
### 1. Livelihood development and new career creation (elevating OTOP and other occupations) Career development and career-building activities (30%)

- Workshop on logo development and the elevation of vegetable plots to tourism and online farms



### 2. Creation and development of a creative economy (enhancing tourism) Creative Economy Creation and Development Activities (30%)

- Create a community database and agricultural plots using infographics
- Workshop on promoting vegetable plots to meet GAP standards



### 3. Applying knowledge to community services (Health Care/Technology) Knowledge application activities for community service (30%)

- Develop a prototype of a smart school
- Bueng Niam application prototype development/online marketing



### 4. Environmental promotion, circular economy (increased circular income for the community) environmental promotion activities (10%)

- Bueng Niam application prototype development ; Bueng Niam vegetable labor marketing ; and Bueng Niam vegetable production planning



Figure 4. Activity carried out

## 5. Performance summary

### 5.1 The value of the work/service delivered “to the community” (Value Proposition for Beneficiary)

Logo development and packaging It is a mechanism to identify agricultural plot specific information. To increase marketing channels and the value of agricultural products of the community.

Application was developed to be a model for managing information in the community to respond to the way of life of fruit and vegetable growers who still lack basic information for making production planning decisions. and bringing the spatial potential to be the highlight It also helps to solve the problem of labor shortage in the agricultural sector. By using application development technology as a mechanism for exchanging and accessing community information, consisting of (1) community production planning database (2) community market database and (3) Community employment database via online system.

A learning point for a prototype of a smart greenhouse at a school to raise the knowledge of youth in the area in applying technology in their careers and improving the quality of life of fruit and vegetable growers in Bueng Niam Subdistrict.

### 5.2 Results/services delivered “Let co-creators benefit from doing social enterprises” (Value Proposition for Co-creator)

Quality of life of farmers through raising the prices of agricultural products and agricultural plots according to GAP standards, coupled with the development of agricultural tourism routes in Bueng Niam Sub-district through the Bueng Niam Application.

Matching between agricultural plot owners who need labor with general workers in the community creates working capital in the community.

Knowledge and youth’s productivity from the learning point, a prototype of smart homes in schools under the product brand “DONDOO SCHOOL ORGANIC”.

### 5.3 Access channels

Farmers are developed with both offline and online service channels, such as selling in community markets. and Ton Tan Market through the storefront, selling via telephone, LINE and via social media Facebook and Application Bueng Niam that the project develops.

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