AN ECONOMICS FEASIBILITY OF THE COMMERCIAL COMMUNITY PRODUCTS IN PHRA NAKHON SI AYUTTHAYA PROVINCE

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Abstract

Support from public and private sectors in pushing community products for sustainability requires the results of an economic feasibility analysis that takes into account economic risks. This research is quantitative research aimed to analyze an economic feasibility and the sensitivity of the commercial community product to use as a basis for academic reference in developing and extending products to create career stability and income. As well as choosing the most cost-effective resources following the economic guidelines. A structural questionnaire was used with 5 product entrepreneurs (Judgement sampling) of BangBan district, Phra Nakhon Si Ayutthaya province. The data was analyzed by ENPV, EBCR and EIRR. The results of the study were as follows: 1) Thepnakha Drinking Water Community Enterprise Group has Economic Value for investment that is Economic Net Present Value (ENPV) is 479,011.08 baht, Economic Benefit-Cost Ratio (EB/C Ratio) is 1.07 times and Economic Internal Rate of Return (EIRR) is 17% and can payback period within 6 years has the potential to resist impact for income changes with 6% and cost changes 15%. 2) Sai Noi Homestay Ecotourism Village It is economical to invest, that is ENPV is 195,616.33 baht, EB/C Ratio is 1.38 times and EIRR is 54% and can payback period within 2 years has the potential to resist impact for income changes with 15%. 3) Takala for health found that Economic Value for investment is as follows: The ENPV = 528,431.09 baht, EB/C Ratio is 1.44 times and EIRR is 8.7 times and can payback period within 0.2 years has the potential to resist the impact of change in income and cost changes more than 15%, while 4) The Banana Processing Group and 5) The Natural material Processing Group, that is not worth the investment when considering the economics. Research results are returned to the community to guide sustainable commercial product development.

Keywords: Economic Feasibility, Sensibility Analysis, Community Products, Phra Nakhon Si Ayutthaya Province

Introduction

Community enterprise development is one of the methods for solving people's poverty and is the way to create a sustainable economy, society, and community because it encourages the community to use local resources so that they can be self-sufficiency in the long run. Small and Micro Community Enterprise (SMCE) is the creative

management of community capital for self-sufficient, where community capital includes resources, agricultural products, knowledge, wisdom, culture, local traditions, and government agencies are important units of community enterprise development both in terms of knowledge development of different skills various, marketing support and regulation to support community enterprises (Jakraphong, 2018; Wanapat, 2021)

However, the promotion and development of entrepreneurs in managing local wisdom and creating innovations, promoting and developing product standards from local wisdom, and promoting community marketing channels to international standards are still a problem at present as community enterprises still face problems that should be addressed accelerate development such as production problems unable to produce in time when large orders, lack of labor, high production costs due to the economies of scale , shortage of modern production technology ,marketing problems, lack of branding and lack of good packaging, lack of modern product design, no distribution channel through e-commerce or a variety of distribution channels, lack of publicity and promotion, as well as problems with product imitations, problems with continuity in supporting budgets from relevant agencies, and problems in waste management as well as legal measures, etc (Kanokrat, D. & Jarunan, M., 2018; Watchirachai, W., 2018; Atchara, M. et al., 2020; Jatika, K., 2020; Norasmas, J. & Jumpot, S., 2021; Ubonwan, S. & Napatcha, P., 2021; Phannipha, S. et al., 2018).

However, the above problems will not arise if, before the implementation of the project by the community itself, or before the implementation of the project from the public or private sectors, the economic feasibility is analyzed, both with and without a comprehensive project. Then it will play a part in reducing the problem of developing community enterprises or community products that cannot go towards sustainability. Sai Noi Community, Bang Ban District, Phra Nakhon Si Ayutthaya Province is another community that has been continuously supported by government and private agencies due to its abundant community resources, unique way of life, suitable for learning and transferring such as Making Thai desserts, Mon bricks, and healthy coconut shells and the processing of agricultural products by community products that are said to have a variety of products, both grouped into community enterprises and housewives such as Thep Nakha Drinking Water Community Enterprise Group, Sai Noi Homestay Ecotourism Village, etc., but found that the supported projects still lack commercial investment worthwhile analysis. As a result, some products, once implemented, cannot create sustainable careers and incomes for the community. Therefore, before the support from government agencies and the private sector in pushing community products towards sustainability, it is necessary to start from an economic feasibility analysis that takes into account the economic risks of community products before proposing is therefore important of this research.

Research objectives

1) To analyze the economic feasibility of commercial community product production

2) To analyze the sensitivity of commercial community products

Literature review

The production and distribution of products have considered the concept of the production cycle which consists of a group of business activities related to the production of goods such as product design, planning and scheduling, production operation, and cost accounting in the collection of production costs uses the composition of costs classified by the nature of the components of the product 3 types are Direct Materials, Direct Labor, and Overhead as follows: 1) Direct Materials are the main raw materials used in production and can be identified in the quantity and cost of the production of a particular product and are classified as the majority of raw materials used in production. 2) Direct Labor is the wages paid to employees directly involved in the production of finished goods and is an important part of the wages for processing raw materials into finished goods. 3) Production costs (Overhead) are expenses related to the production of goods other than direct raw materials and direct labor costs (Marshall, B. et al., 2011; Don, R. H. & Maryanne, M. M., 2005). Economic Feasibility Study is the study of economic feasibility based on the pricing of benefit and cost based on the efficiency of resource utilization for production. The price used is called “efficiency price” and the collective analysis is called “Economic Cost-Benefit Analysis” (Nancy, D. et al., 2005).

Project sensitivity analysis is a method of analyzing the best future outcomes from related events by calculating the rate of return on project investment under risk and uncertainty but can estimate probabilities (Probability or expected value) where risk events and economic uncertainties may affect investment decisions, therefore, the sensitivity analysis of the project is required are 1) costs increased by 5, 10 and 15 percent while fixed income 2) revenue decreased by 5, 10 and 15 percent while fixed costs and 3) revenue decreased by 5, 10 and 15 percent, while costs increased by 5, 10, and 15 percent (Maria, D., 2020).

The benefit of sensitivity analysis is to identify variables that cause volatility, the net return of a project to help assess the project more efficiently and that assessment should consider whether the return or benefit derived from the decision is worth enough to offset any potential risks.

From literature review able to synthesize as the research conceptual framework. Figure 1.

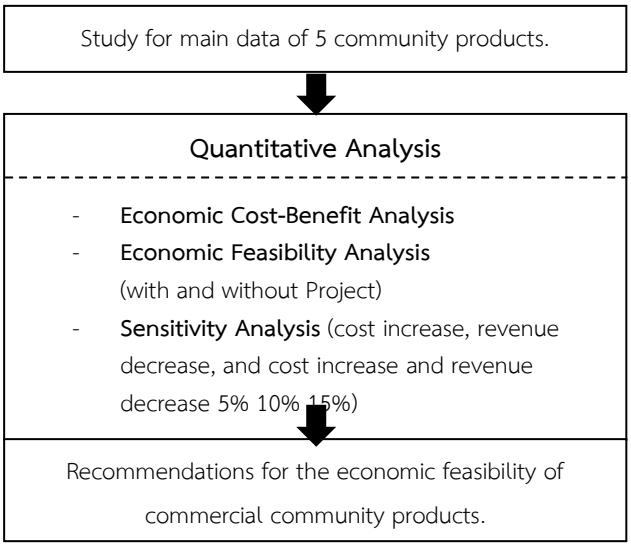

Figure 1 Conceptual framework of an economic feasibility of the commercial community products in Phra Nakhon Si Ayutthaya province.

Research methods

This research is analytical. Emphasis is placed on cost-return analysis and economic feasibility. And the sensitivity of commercial community products. As a basis for product development or continuing to expand the details of the research are as follows:

Data Collection

In-depth Interview with Key Informants by using a specific selection method (Purposive Sampling) with the chairman of the main product group of Sai Noi Community, Bang Ban District, Phra Nakhon Si Ayutthaya Province, 5 people are the group leader of 1) Thepnakha Drinking Water Community Enterprise Group 2) Sainoi Homestay Ecotourism Village 3) Takala for health 4) The Banana Processing Group and 5) The Natural Material Processing Group

Structural Questionnaire consists of quantitative and qualitative questions that are both open-ended and closed-ended questions are divided into two parts: 1) Information about community products and 2) Information about costs and returns on product production.

The tool test was a validity test by 5 experts and used to determine the Index of congruence (IOC) by improving and selecting questions with an IOC value greater than 0.5 to be used as a question (Nancy, D. F., et al., 2005). And find the reliability by using the questionnaire to test with product groups in other areas (Try out) amounting to 30 cases and then analyzed for the total reliability using Cronbach's alpha method (Nancy, D. F. et al., 2005). By using acceptance criteria of more than 0.70 from the test, it was found that the total reliability level was at 0.8783, which was higher than the acceptance criteria.

Data analysis

Economic Net Present Value: NPV is the present value of the project's net return or cash flow taking into account the opportunity cost of 1.15% fixed deposit, calculated over the project lifecycle from 2013 to 2019 (before the Covid 19 crisis) using a discount rate of 7% (Don, R. H. & Maryanne, M. M., 2005). The formula used for the calculation as follows:

$$ENPV = \sum_{t=0}^{n} \frac{(B_t - C_t)}{(1+r)^t}$$

Here ENPV means Net present value
Bt means Benefit value in year t
Ct means Cost value in year t
r means Appropriate discount rate or interest rate
t means Project duration from year 0, 1, 2, ..., n
n means Project life (years)

The NPV value should be greater than 0.

Economic Benefit Cost Ratio (BCR) is the ratio between the present value of the return flow and the present value of the cost stream over the project life from 2013 to 2019. The formula is used to calculate as follows:

$$BCR = \frac{\sum_{t=0}^{n} \frac{B_t}{(1+r)^t}}{\sum_{t=0}^{n} \frac{C_t}{(1+r)^t}}$$

BCR should be greater than or equal to 1.

Internal Rate of Return (IRR) is the rate of return of a project in which the present value of costs and the present value of investment project expenses equal the present value of the investment project expenditure, which is the rate of return that makes it break even. The formula is used to calculate as follows:

$$\sum_{t=0}^{n} \frac{(B_t - C_t)}{(1+r)^t} = 0$$

The IRR should be greater than the opportunity cost (7% in the case of high interest on a Thai state bank's prime loan).

Research results

The economic feasibility analysis of 5 main products in Sai Noi community found that 1) Thepnakha Drinking Water Community Enterprise Group 2) Sai Noi Homestay Ecotourism Village and 3) Takala for health it is economically worthwhile to invest when analyzing economic feasibility taking into account economic sensitivity, but 4) The

Banana Processing Group and 5) The Natural Material Processing Group Not worth the investment considering the economics. Details as follows

1) Thepnakha Drinking Water Community Enterprise Group using a water filtration system with R.O. (Reverse Osmosis) system with the selling point is the taste of drinking water is similar to "rainwater", which is a particular favorite of the people in Phra Nakhon Si Ayutthaya Province. The R.O. water filtration system is a filtration system using a membrane with a resolution of 0.0001 microns, which makes the solution, contaminants, including various pathogens larger than the pores of the membrane, the membrane cannot penetrate through it, only pure water molecules can pass through the solution and are separated from the bile and eliminated from the system to prevent residual and accumulation within the diaphragm with a water filtration plant illustration. Figure 2.

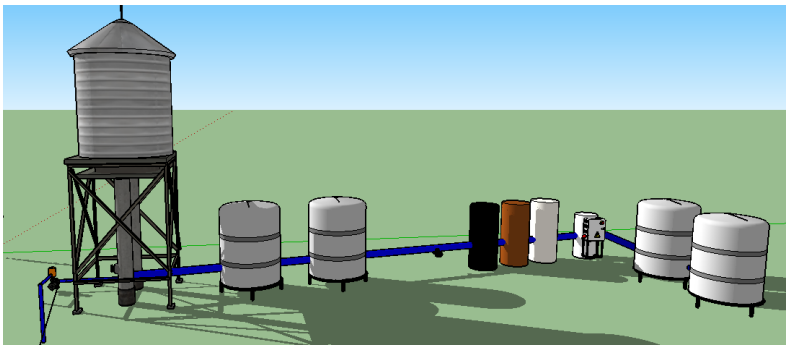

Figure 2 R.O. model of Thep Naka drinking water filtration plant

The cost of producing drinking water Thep Nakha

Number of drinking water production for sale 48,761.40 liters

Cost of electricity and chemicals 38,600.00 baht

Cost of producing 1 liter of water 0.79 baht, Able to calculate total variable cost per bottle size equal to 2.70, 3.17, 3.30, 3.42, and 0.87 baht per bottle of 350 cc, 500 cc, 600 cc, 750 cc, and a glass of 220 cc, respectively. The selling price per unit is 4, 3. , 5, 3, baht per bottle, 350 cc (40 baht/pack), 500 cc (35 baht/pack), 600 cc (55 baht/pack), 750 cc (40 baht/pack), and 220 c glass. C (65 baht/box), respectively.

Economic Feasibility Analysis in without Project is to produce drinking water in glass and bottles according to the minimum order per month as follows: Size 350 cc, 800 packs, 500 cc. 200 packs, 600 cc., 850 packs, 750 cc., 200 packs and 375 cartons of 220 cc glass. It was found that it was economically feasible to invest. Economic Net Present Value is 479,011.08 Economic Benefit Cost Ratio is 1.07 times and Economic Internal Rate of Return is 17 % and can payback within 6 years (Discount Payback Period is 5.83).

If there is a project, if the business follows the advice from choosing to pump water during the Off-peak period (from 22.00 – 08.30 hrs.) and produces drinking water in a minimum quantity, it will result in savings per unit of cost from 0.79 baht, remaining 0.22 baht found that it was economically feasible to invest. Economic Net Present Value is 1,152,451.35 baht, Economic Benefit Cost Ratio is 1.23 times, and Economic Internal

Rate of Return is 47%, the payback period is 4 and a half years (Discount Payback Period is 4.35).

Table 1 The results of the sensitivity analysis of Thep Nakha Drinking Water Community Enterprise

List	Without project			With project		
	ENPV	EBCR	EIRR	ENPV	EBCR	EIRR
Base year	479,011.08	1.07	17%	1,152,451.35	1.23	47%
Costs increased by 5 % and returns decreased by 5%	(1,255,750.09)	0.82	-28%	585,818.86	1.11	25%
Costs increased by 10%and returns decreased by 10%				19,186.37	1.00	8%
Costs increased by 15%and returns decreased by 15%				(547,446.13)	0.91	-7%
The level that the business can accept Costs increased by 15%and returns decreased by 6%				**14,383.43**	**1.00**	**7%**

The Sensibility Analysis found that Thep Nakha Drinking Water Community Enterprise Group is a worthwhile commercial investment considering the economic risks if management is adjusted as recommended. In the case of having a project, it will result in the business having the potential to resist the impact of the change in selling prices (revenues can be reduced by up to 6%) and the cost of change (prices of production factors, prices of electricity, chemicals, packaging increases up to 15 percent). If the business is operating according to recommendations, it will increase the business's competitiveness (A 6 percent increase in returns and a 15 percent reduction in production costs).

2) Sainoi Homestay Ecotourism Village

Homestay Sai Noi offers homestay activities which consist of staying in a traditional Thai house, learning a local lifestyle and cooking with the owner of the house, giving alms to monks in the morning, learn how to make Thai desserts, practice and learn to pack drinking water, making sandalwood flowers, farming, growing vegetables, agriculture, study and learn about ancient sites, religion, history, art and culture, language exchange. Sai Noi Homestay has passed the Thai homestay accreditation standard since 2009 until now, with a total of 15 households, it can accommodate up to 270 guests, it covers the area of villages 1-10 in Tambon Sai Noi, Bang Ban District.

Cost of opening a house

Number of services 192 people/year

Room compensation 250 baht/person/night

The results of economic feasibility analysis without Project revealed that there is the economic feasibility of investment. Economic Net Present Value is 195,616.33 baht,

Economic Benefit Cost Ratio is 1.38 times and Economic Internal Rate of Return is 54%, can payback within 2 and a half years (Discount Payback Period is 1.66).

From the survey area, two approaches to homestay service can be synthesized. The first approach is to change the service from sharing accommodation with homeowners to provide a private home, which can serve 4-6 tourists per house, maintaining the same service characteristics in all respects, just that customers will receive privacy, which will be charged an additional 450 baht per person from the same service nights and The second approach will continue to offer shared accommodation with landlords but will add one more private house, each of which will accommodate four to six tourists each by maintaining the same service characteristics in all respects, only customers will receive privacy, which will be charged an additional 450 baht per person per night from the same service, that is, the second approach is to target customers to 2 targets are customers who only want cheap overnight accommodations and customers who want eco-tourism and privacy who agree to stay at a higher price. This will result in the business owner, the homeowner, creating more income opportunities as an example of a house in the Figure 3

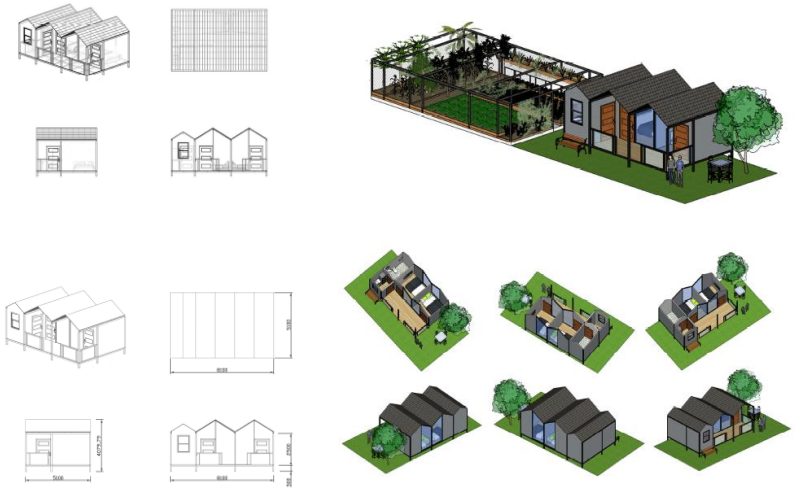

Figure 3 Example of a private house

In the case of a project, there are 3 types of guidelines as follows: 1) providing accommodation with a homeowner (according to the Thai homestay standard), 2) providing a private house, and 3) providing a shared accommodation with a homeowner and private houses found that investment in homestay services in Sai Noi, Bang Ban in all 3 approaches is economically feasible for investment. Economic Net Present Value greater than 0, Economic Benefit-Cost Ratio greater than 1, and Economic Internal Rate of Return greater than 7% return on capital utilization and can payback within 6 years.

Table 2 Results of Sensitivity Analysis of Sai Noi Homestay

List	Costs increased and returns decreased		
	5%	10%	15%
Without project			
ENPV	36,612.96	19,726.31	2,839.66
EBCR	1.25	1.13	1.02
EIRR	38%	23%	9%
With project (house with owner)			
ENPV	46,220.32	25,182.34	4,739.51
EBCR	1.24	1.13	1.02
EIRR	55%	42%	28%
With project (private house)			
ENPV	80,756.73	(10,316.87)	(101,390.47)
EBCR	1.09	0.99	0.89
EIRR	10%	7%	4%
With project (shared house with owner and private house)			
ENPV	224,104.83	50,822.29	(60,153.19)
EBCR	1.22	1.05	0.95
EIRR	14%	9%	5%

The results of the sensitivity analysis revealed that Sai Noi Homestay, Bangban is a worthwhile commercial investment considering the economic risks if there is a change in marketing planning and management strategy according to Thai homestay standards. As a result, the business has the potential to resist the impact of changes in selling prices (revenues can be reduced by up to 15%) and cost changes. (Factory price increases by up to 15 percent) shows that if the business is adjusted according to the recommendations, it will increase the business's competitiveness (15 percent increase in return and 15 percent reduction in production costs).

3) Takala for health

Ta Kala for health It is the use of local wisdom to add value to natural scraps that are not being utilized, that is, to add value from shell scraps worth 3 baht per piece to 379 baht per unit (Finger 4) by a fixed cost of the investment at the first is 16,386.30 baht and the average variable cost per year per production of 1,200 pieces is 312,258.14 baht, the average cost per piece is 262.90 baht, the selling price is 379 baht per piece.

The results of economic feasibility analysis found that investing in Ta Kala for health production has economic potential results in investment are Economic Net Present Value of 528,431.09 baht, Economic Benefit Cost Ratio of 1.44 times and Economic Internal Rate of Return of 8.7 times, indicating that Ta Kala for health can operate business as usual by producing 1,200 pieces of Ta Kala for health per year, sold for 379 baht per unit and can pay back within 2 and a half months (Discount Payback Period is 0.21).

Table 3 The results of the sensitivity analysis of Takala

List	Returns decreased		
	5%	10%	15%
Without project			
ENPV	380,575.10	232,719.10	84,863.10
EBCR	1.30	1.17	1.06
EIRR	605%	364%	142%

The sensitivity analysis revealed that Takala for health is economically viable and has the potential to withstand the impact of changes in selling prices (up to 15%) and cost changes (the price of inputs up to 15 percent).

4) The Banana Processing Group

The banana processors group classified into 2 groups as follows: 1) Cavendish banana, it was found that the cost of producing processed bananas (Only those that are out of grade)

Production amount 1,200 bags/year

Selling price 10 baht/bag

Unit cost 26.81 baht/bag

The results of the economic feasibility analysis revealed that the investment in banana production degraded in processing had the result that there was no economic feasibility of the investment, i.e. Economic Net Present Value was less than 0 (-3,386.73 baht), Benefit-Cost Ratio less than 1 (0.50 times) indicates that the processed banana products are out of grade, which unable to run business considering the production capacity of 1,200 bags of processed bananas per year are sold for 10 baht per unit due to the cost per unit of 26.81 baht.

And 2) Pisang Awak banana, the cost of producing the Pisang Awak banana chips

Production volume 4,800 bags/year

Sold per bag, 8 baht/bag

Average cost 7.73 baht/bag

The results of **economic feasibility analysis** found that investing in the production of Pisang Awak banana chips, there is no economic feasibility of investment are Economic Net Present Value is less than 0 (-24,757.00 baht), Economic Benefit Cost Ratio is less than 1 (0.80 times). Not taking into account the fixed costs and not considering the value of the bananas produced by the farmers themselves. As a result, the selling price of the processed banana products was wrong. Including agriculture, it is seen as adding value to “Bananas are out of grade” which cannot be sold and must be given for free. However, the research team conducted a comparative analysis of the case of processing into other products, such as Khanom Khao Tom Mud, found that the yield was better by comparison. Therefore, the results of the analysis are returned to the community as an alternative to consider adding value to “Bananas are out of grade” next.

5) The Natural Material Processing Group

Cost of making artificial flowers (funeral wood flower)

Single funeral wood flower	1,000	flowers
Selling price	3	baht/flower
Unit cost	3.69	baht/flower

Economic feasibility analysis results was found that the investment in transforming natural materials into funeral wood flower was not available for sale due to the entrepreneurs being volunteers, so they produced for donations and were not sold commercially. As a result, when analyzing the feasibility of commercial economics, therefore, it is not worth the investment.

From the contextual analysis, the area can make recommendations as follows: 1) Entrepreneurs should consider setting the selling price at 4 baht per unit (market price 5 baht per unit. At present, coffin shops are promoting, procuring, and selling funeral wood flowers, making it difficult to operate commercially. 2) Sunk costs should be considered due to occasional procurements, unstable costs, and belief in the production of goods (producing funeral wood flowers in the home will result in the death of the occupants of the house, etc.), and 3) there should be taking into account the sales mix because they do not produce and sell a single product.

The results of economic feasibility analysis can conclude the finding as table 4.

Table 4 the results of the economic feasibility analysis of 5 community products

Detail	Economic feasibility analysis				
	Thepnakha Drinking Water	Sai Noi Homestay	Takala for health	The Banana Processing	The Natural material Processing
ENPV (baht)	479,011.08	195,616.33	528,431.09	N.A.	N.A.
EBCR (times)	1.07	1.38	1.44	N.A.	N.A.
EIRR (%)	17	54%	870%	N.A.	N.A.
PB (year)	5.83	1.66	0.21	N.A.	N.A.

Discussions

An analysis of the economic feasibility and sensitivity of the above 5 commercial community products found that Thep Nakha Drinking Water Community Enterprise Group, Sai Noi Homestay Ecotourism Village, and Healthy Takala are economically feasible and worth the investment. When considering the economic sensitivity in terms of cost and income changes, this is consistent with several studies in Thailand looking at the development of community products that are close to all 3 products, such as: In the case of community drinking water, it is found that it is possible to invest when choosing Reverse Osmosis (RO) system with a net present value of 107,888 baht, a return to cost ratio of 1.15, a projected return of 10.3, and a payback period of 7 years and 10 months shows (Pongphan, P., 2015). In the case of homestay accommodation products, it is found that there is a high probability of commercial business operation

when study the feasibility of expanding the Homestay business by analyzing the overall business operation in term of environmental factors including internal and external factors (Sreewan, C., 2018). When considering the feasibility of the homestay project, it was found that the project was worth the investment. The net present value (NPV) is greater than 0 (15,170,823 baht), the project's internal rate of return (IRR) is 82%, above the cost of financing (WACC) of 15%, and the payback period (PB) is 1.5 years, which Less than what the company had set the target (3 years) shows the attractiveness and the worthiness of the investment (Thanika, C., 2018). In particular, Homestays with separate accommodation sections are particularly attractive (Montira, S., et al., 2018). And should focus on the potential analysis because it will affect the success of operations in terms of economic, social, and environmental (Praphunphong, C., 2020; Wanlop, W. & Santidhorn, P., 2019). And the case of product development from coconut shell according to the creative economy resulted in an increase in revenue from the previous 20% (Apsorn, E., et al., 2019). In particular, health promotion innovations from coconut shell or local waste materials are used to lead to sustainable communities (Faisol, M., 2020).

Building stability and sustainability of community enterprises requires cooperation from various sectors both public and private, community participation by returning information to the community, methods for creating occupational and income stability, the potential of the community, and resource capacity (Wanapat, S., 2021; Watchirachai, W, 2018; Praphunphong, C., 2020; Faisol, M., 2020; Jittapon, C, 2017).

Body of knowledge

Community enterprise development is one of the tools used by the government to solve people's poverty by allocating budgets to upgrade products to push community products to the international market. But without an analysis of the economic feasibility or cost-effectiveness of commercial investment taking into account risks and uncertainties, would lead to unsustainability in the future. That is the problem of community enterprise development at present. That is, people are encouraged to collectively produce new products without analyzing the market feasibility of “producing, but not actually selling” or “not being worth it” because of the lack of comprehensive economic analysis of the economy, society, environment, and culture, which are the first tools that should be picked up before creating an action plan for supporting the budget for the most efficient use of resources and to be the foundation of a good process towards sustainability of the fundamental economy.

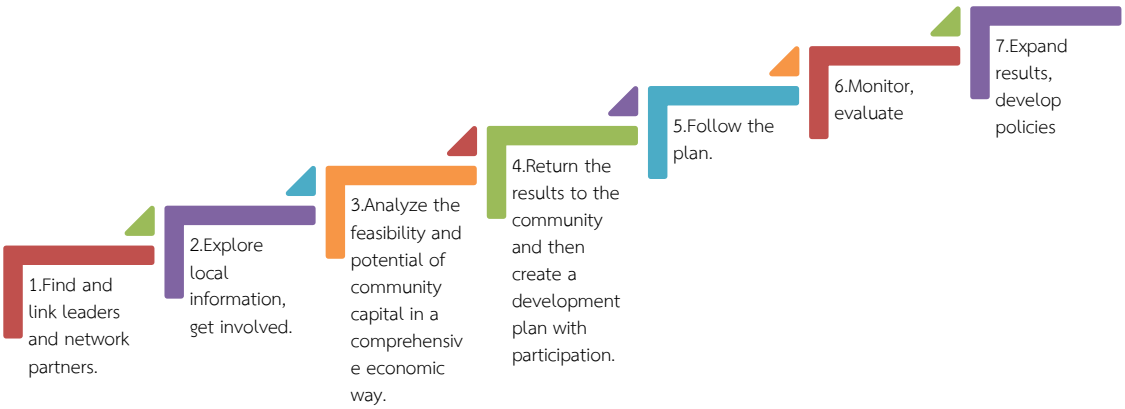

Figure 4 Fundamental economic development based on comprehensive economic analysis.

Conclusion

An Economics feasibility analysis of the commercial community products. To be the basic information for supporting the use of community resources to produce products to enhance the career and sustainable income of the community. The results show that Sai Noi Bang Ban community products have 5 main products that combine professional groups as follows: (1) Thepnakha Drinking Water Community Enterprise Group (2) Sainoi Homestay Ecotourism Village (3) Takala for health (4) The Banana Processing Group and (5) The Natural Material Processing Group. The results of the feasibility analysis of economics showed that community products, Cavendish banana chips and funeral wood flower were not cost-effective. Because both product groups Lack of consideration of opportunity cost of using raw materials in production (deteriorated bananas and banana peel scraps) as well as the labor cost of the producer. Therefore, when analyzing economics value as a result, production costs are higher than revenues. The main problem arises from the lack of commercial business planning, market analysis, diseconomies of scale as a result, the cost of production per unit is higher than the market price (cost price of funeral wood flower is 3.69 baht, market price 2 baht). From the results of the analysis, it was found that pushing community products towards sustainability It is necessary to an economics feasibility analysis of commercial products before the public or private sectors come to support.

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