

Evaluating Economic, Social, and Environmental Values Guideline





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Social Impact and Economic Contribution

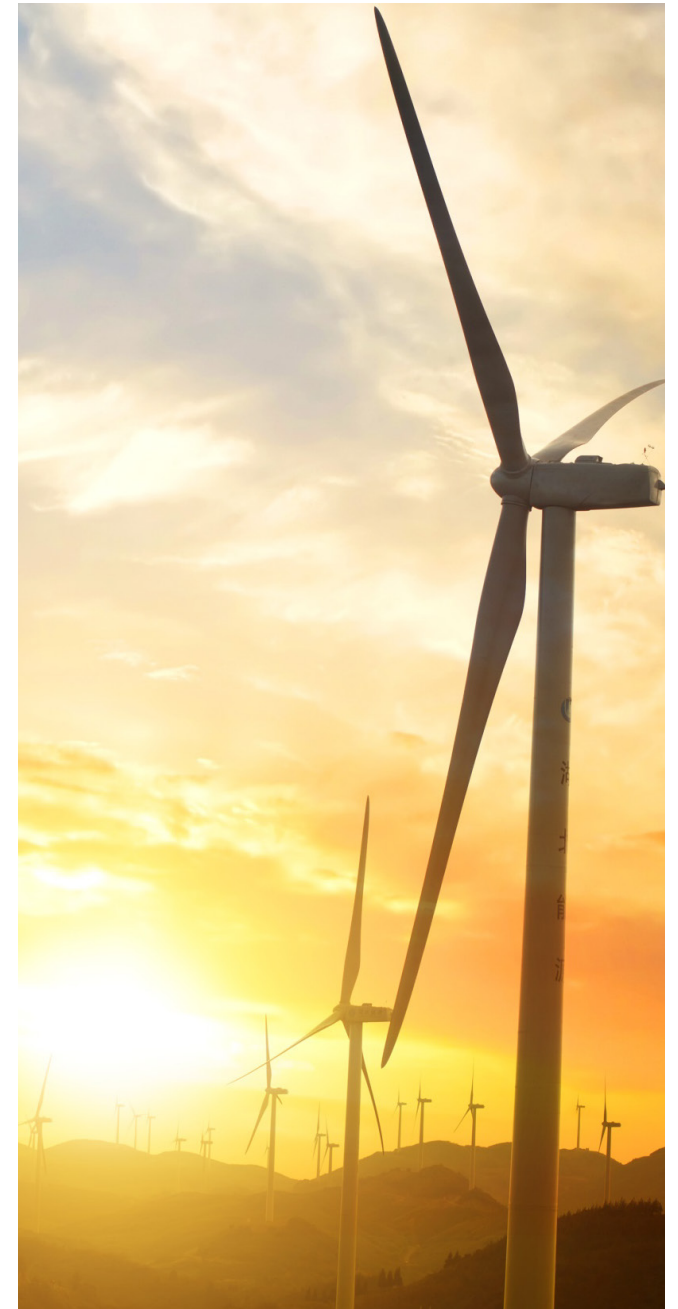
Charoen Pokphand Group recognizes that the economy and society play an important role in business operations. Therefore, it is important to take part in managing social issues and creating shared value through promoting careers and income for various groups of people, such as farmers and small entrepreneurs, so that they can be able to achieve sufficient consumption and utilization, as well as become self-reliant. Moreover, we are also aiming to promote the quality of life for vulnerable groups so that they can live equally in society. However, the group realized the true value of projects and activities that we created and developed together with the community and the impact of the projects both positive and negative, on the economy, society, and environment.



Charoen Pokphand Group has developed an operational strategy to increase social value by referring to the Group's identity, namely gratitude and honesty, the 3-benefit values, the CP excellence system, and 2030 sustainable development goals. In addition to internal factors, we also take community and social concerns and the United Nations Sustainable Development Goals into consideration when developing strategies. This is to create a balance between responding to the needs of communities and society in a sustainable way as well as the overall business growth of the Group.

Social Impact and Economic Contribution 2030 Goals

Charoen Pokphand Group has set goals to promote and support farmers, SMEs, vulnerable groups and others throughout the supply chain to be able to have jobs and generate income for 5 million people in order to create a good quality of life as well as positive impacts on communities and society.



Introducing the Economic, Social, and Environmental Impact Valuation Guideline

Charoen Pokphand Group strives to develop and drive the society and environment towards sustainability. Such commitment is discernible in the implementation of social and environmental projects. Through such projects, the Group shares and extends our experiences and knowledge with a focus on comprehensive development while creating an economic, social, and environmental balance. The Group collaborates with relevant organizations to advocate for changes at the national level which is in accordance with the 'Three-Benefit Principle'.

The valuation of economic, social, and environmental impacts enables the Group to predict and forecast whether the implementation of a project will be cost-effective, and what social and environmental changes will occur from such a project. It also helps the Group to understand impending social and environmental changes in order to plan for change management and control as well as define mitigation measures to minimize negative social and environmental impacts while maximizing positive contributions.

Charoen Pokphand Group has developed the Economic, Social, and Environmental Valuation Guideline as a tool to assess the true value of the projects which are supported and developed by the Group for society. In doing so, the Group has adopted the World Business Council for Sustainable Development (WBCSD)'s principles, namely the Natural Capital Protocol and the Social & Human Capital Protocol (Figure 1), as a model in formulating the Guideline by combining both methodologies which feature similar objectives, concepts, and practices.

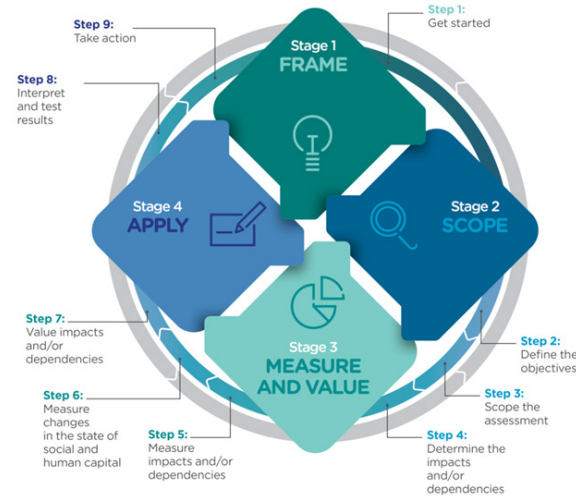


Figure 1 Social & Human Capital Protocol

Source: Social & Human Capital Coalition, 2019

The details of the evaluation process have been modified for concision and ease of application. Charoen Pokphand Group's Impact Valuation Guideline comprises four stages of evaluation (Figure 2-Draft), namely:

- Stage 1: Frame
- Stage 2: Scope
- Stage 3: Measure and Value
- Stage 4: Apply

Each stage consists of objectives, steps and expected outputs. The steps included in this Guideline will focus on social and natural capital impacts as most businesses have developed handbooks and guidelines on these two concepts.

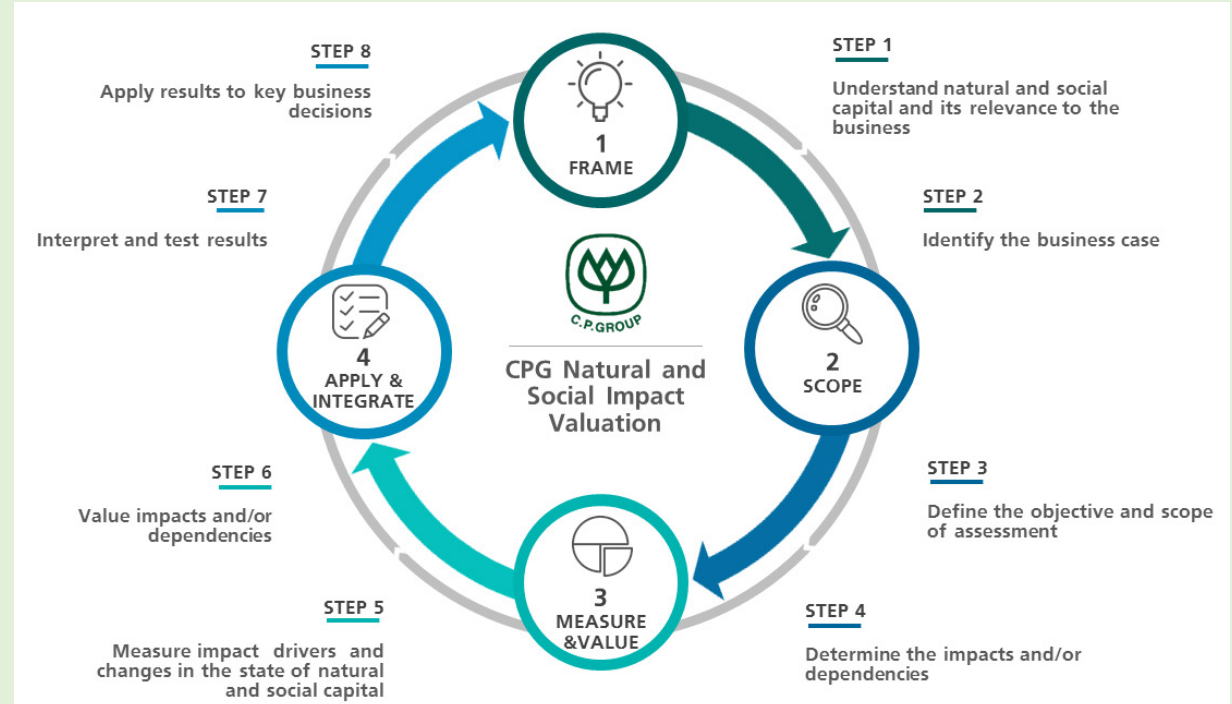


Figure 2 Natural and Social Impact Valuation Frame (Charoen Pokphand Group, 2022)

Stage 1 Frame

Objective

Describe the importance and reasons why the organization should conduct an economic, social, and environmental impact valuation.

Step 1 Understand natural and social capital and its relevance to the business

In this step, the organization should review how the impacts of business operations or a project relate to natural and social capital; this connection may be positive or negative. Such impacts may generate costs and benefits not only for the business but also for the society and the environment. Therefore, understanding the relationship between business, society and environment can accelerate risk reduction and increase decision-making opportunities for the organization.

As shown in Figure 3, businesses can have both direct impacts on society (arrow 1a), e.g., through employment and the paying of wages, and indirect impacts on the environment (arrow 1b), e.g., through the emission of pollutants which cause health problems to local community members. However, businesses depend on social capital (arrow 2) and natural capital, e.g., businesses require healthy and skilled employees and depend on quality natural raw materials for the production process, etc. In some cases, social impacts from business operations can be reflected on the business (arrow 3), e.g., unfair working conditions can affect employee engagement and decrease work efficiency, etc.

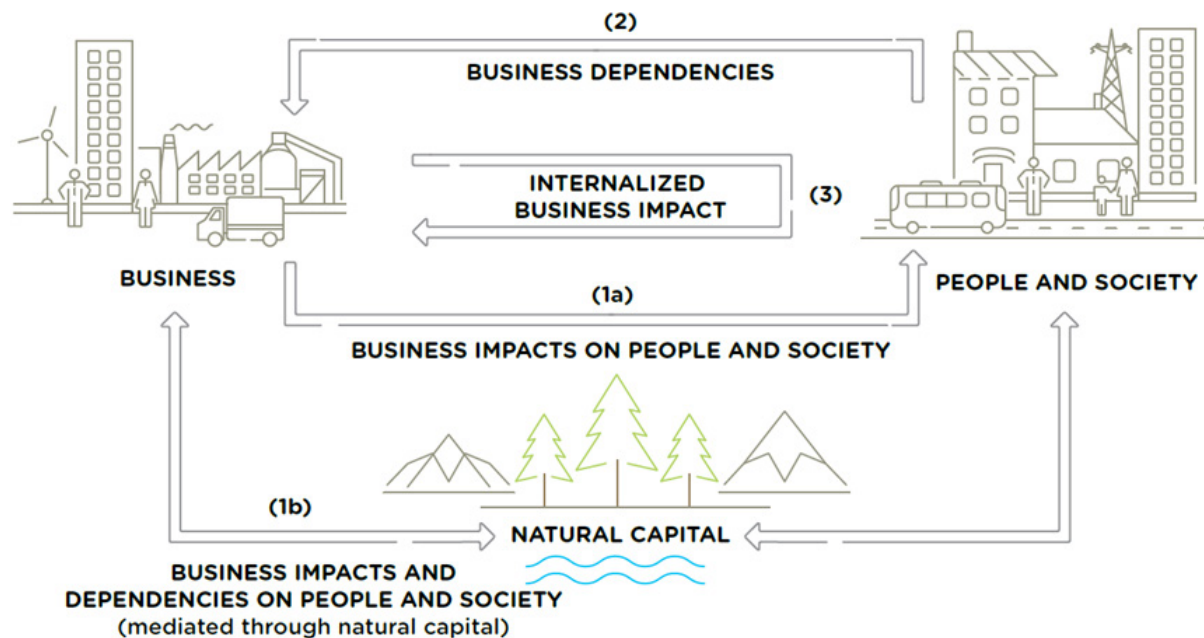


Figure 3 Relationship between business, social and natural capital (adapted from Natural Capital Protocol, 2016)

Step 2: Identify the business case

In this step, the organization should clearly identify how social and natural capital relate to business. Under this assessment, the business case is referred to the assessment of potential risks and opportunities for the economy, society and environment while taking into account stakeholders' concerns. The identification of such risks and opportunities will enable the organization to select appropriate issues to be included in its decision-making process. Focusing on what truly matters will help the organization decide whether a project should be implemented, or whether it is necessary to come to an understanding with the society and community to achieve a mutual agreement.

The risk and opportunity assessment takes into consideration all business dimensions, e.g., operational, legal, regulatory, financing, reputational, marketing, and societal, etc. It may also assess business drivers, e.g., products or services, employees, intellectual properties, raw material selection, etc. Furthermore, the factors that are assessed may be important during different phases. Organizations that already assess the economic, social, environmental, and other aspects of risks and opportunities can include such information in the decision-making process during this step.

Table 1 Examples of social and natural capital risks and opportunities for business

Dimension	Risks	Opportunities
Operational	<p>Social Capital</p> <ol style="list-style-type: none"> 1. Local communities at risk of land shortages 2. Community members at risk of health problems <p>Natural Capital</p> <ol style="list-style-type: none"> 1. Increased costs, e.g., social conflicts over resources or pollution 2. Increased raw material or resource costs, e.g., higher water charges 	<p>Social Capital</p> <ol style="list-style-type: none"> 1. Create jobs and careers in communities 2. Children receive more opportunities in education <p>Natural Capital</p> <ol style="list-style-type: none"> 1. Increase value and reutilize waste 2. Reduce the costs of resource inputs by, e.g., enhancing efficiency or switching suppliers.
Marketing	<p>Social Capital</p> <ol style="list-style-type: none"> 1. Decreased number of suppliers 2. Lack of customer trust, reduced market share <p>Natural Capital</p> <ol style="list-style-type: none"> 1. Costs in applying for a product's environmental certification 	<p>Social Capital</p> <ol style="list-style-type: none"> 1. Approval of community, market expansion opportunity <p>Natural Capital</p> <ol style="list-style-type: none"> 1. Increase market for eco-products 2. Rising demand for environmentally certified products
Legal and Regulatory	<p>Social Capital</p> <ol style="list-style-type: none"> 1. Fines due to non-compliance with new laws or increased costs due to legal changes <p>Natural Capital</p> <ol style="list-style-type: none"> 1. Legal expenses, fees related to environmental activities, e.g., waste disposal, GHG emissions reduction 	<p>Social Capital</p> <ol style="list-style-type: none"> 1. Approval of stakeholders, e.g., customers, communities, governments <p>Natural Capital</p> <ol style="list-style-type: none"> 1. Reduce environmental fees and charges



Outputs of Stage 1

1. An understanding of how social and natural capital relate to business activities.
2. Knowledge of how to apply the business case in assessing and selecting key issues to be incorporated in the economic, social, and environmental impact valuation.



Stage 2 Scope

Objective

To define the objective and scope for impact measurement and valuation.

Step 3 Define the objective and scope of assessment

The organization can determine the scope of assessment based on potential, suitability to a specified period as well as personnel and resources supporting the project.

Actions

3.1 Determine the objective of the activity or project that will undergo impact assessment and analysis.

3.2 Identify internal and external stakeholder groups relevant to the objective of the activity to be assessed; these stakeholders are affected both positively and negatively.

- External stakeholders, e.g., customers, suppliers, communities, governments, foundations, investors, independent organizations, etc.
- Internal stakeholders, e.g., the Board, committees, executives, employees, marketing department, procurement department, etc.

3.3 Define the scope of assessment. In this step, the organization can determine the scope of assessment for specific projects, areas of operations, parts of the supply chain, etc., or employ data from the organization's materiality assessment. Initially, the assessment scope may be narrowly defined to test the method of assessment. If such a method is deemed appropriate, the scope of assessment can be extended in the future.

Step 4 Determine the impact and/or dependencies

This step features the identification of social and natural capital issues related to business in order to assess which impacts are most significant and most relevant to the business within the scope defined in Step 3 as well as to show the connections between the issues and the organization's activities in the form of an impact pathway.

4.1 Determine an impact pathway to understand the connection between the organization's activities and social and natural capital issues (also called the chain of outcome or the theory of change in some publications). The impact pathway consists of the following elements:

- Input refers to the resources necessary to carry out an activity, e.g., people, time, investment, water, electricity, fuel, etc.
- Activities refer to the organization's activities within the assessment scope that affect social capital and natural capital.

- Output refers to results of the activities, e.g., the number of people trained, the number of employments, the amount of greenhouse gas emissions, etc.
- Outcome refers to changes incurred from activities on stakeholders, e.g., reduced work-related accidents, increased income for community members, lower GHG emissions, increased number of forests, etc.
- Impact refers to changes related to the better living, well-being and health of stakeholders as a result of activities, e.g., if the outcome is the increased income of community members, the possible impact could be the better living of community members which leads to the better education of their children, or if the outcome is the increased number of forests, the possible impact could be greater carbon dioxide absorption and forest products that could generate community income, etc.

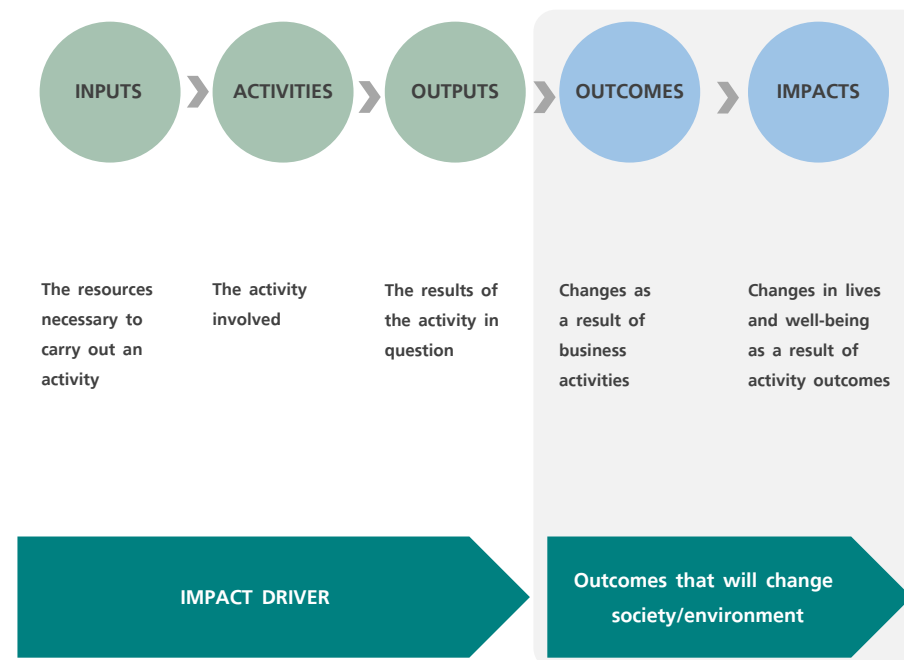


Figure 4 Impact pathways (adapted from the Social Capital Protocol, 2017)

The determination of the impact pathway in each business may differ or be denominated differently. However, regardless of the format, the impact pathway will reveal changes which includes short-term changes or long-term change trends.



Example Impact pathways

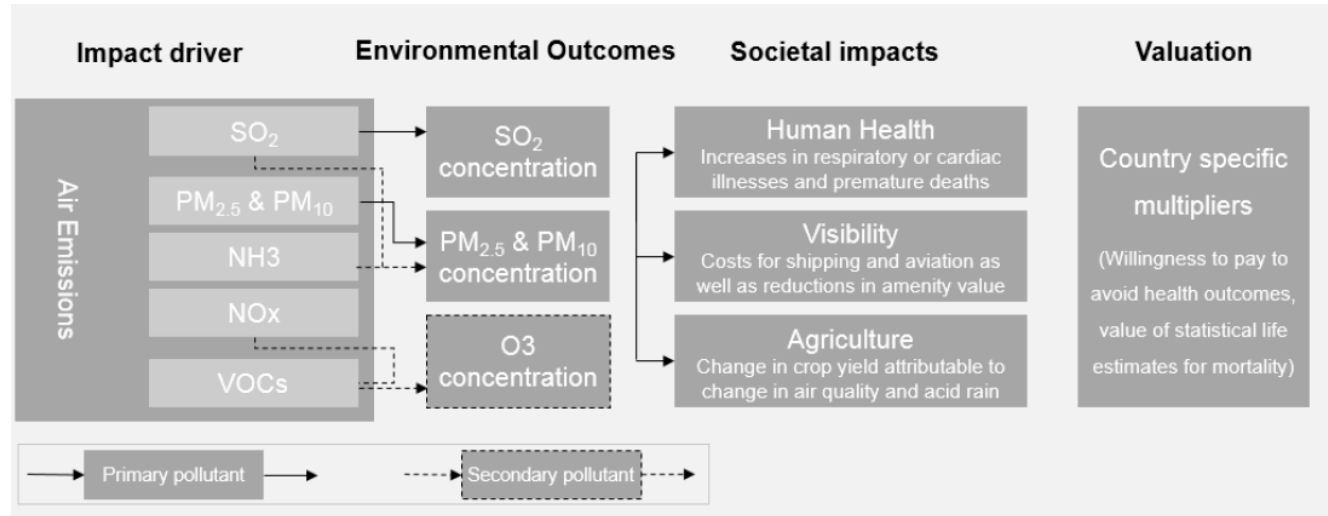


Figure 5 Example of impact pathways – Air Pollution of BASF

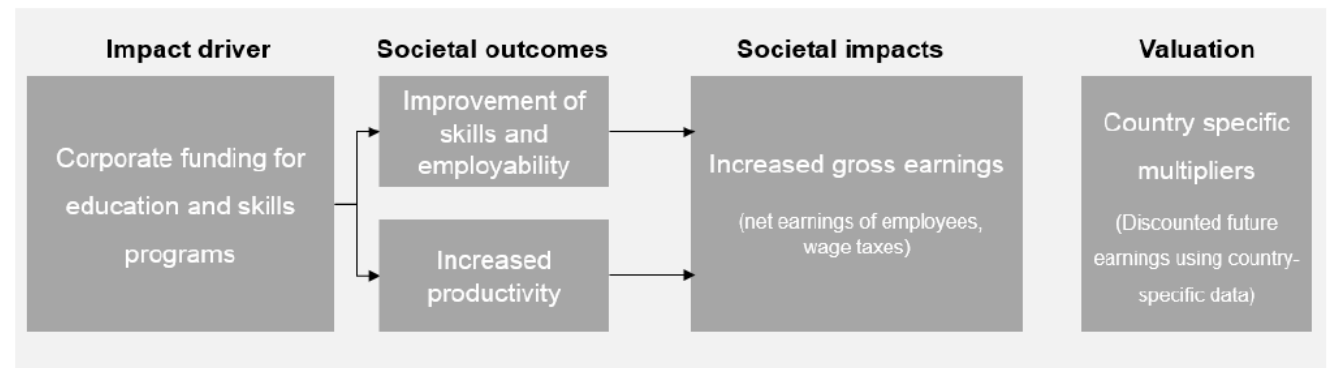


Figure 6 Example of impact pathways – Human Capital, BASF

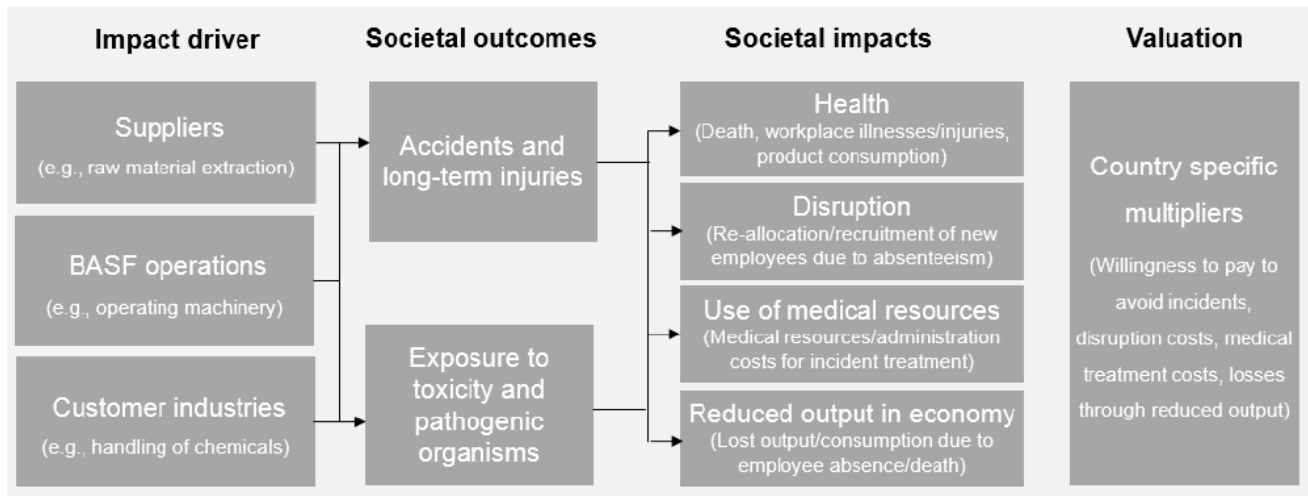


Figure 7 Example of impact pathways – Health and Safety,

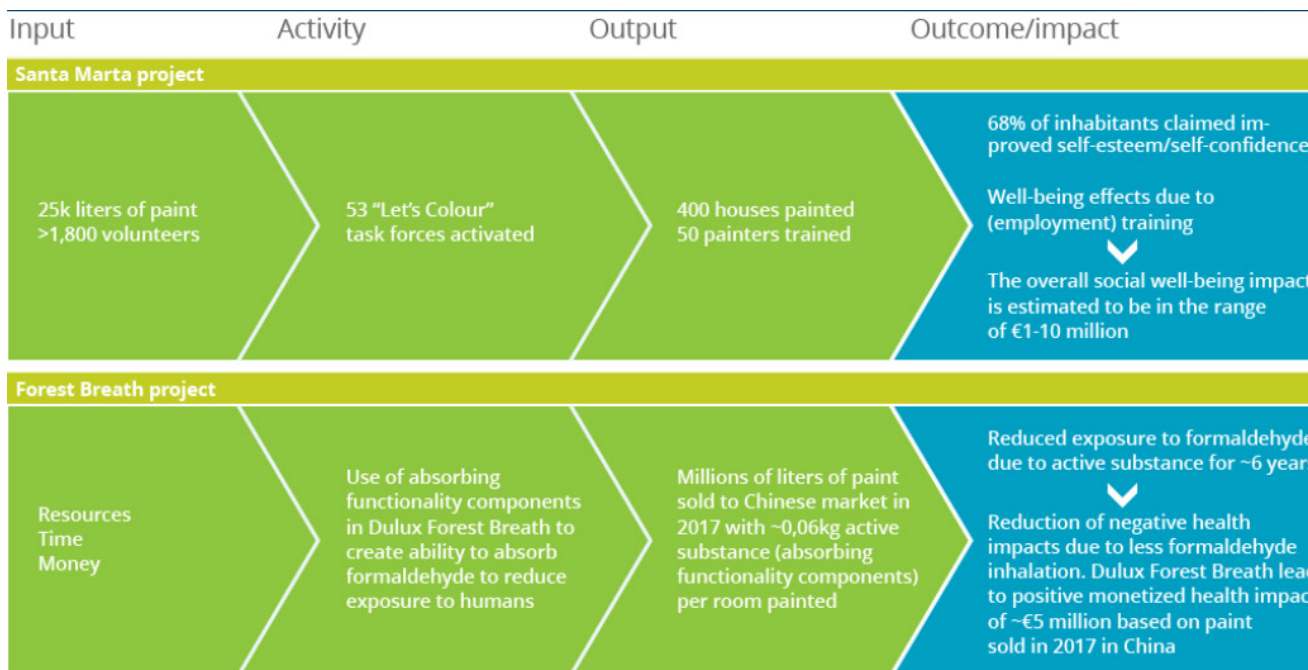


Figure 8 Example of impact pathways, AkzoNobel

4.2 Prioritize social and natural capital issues by considering issues with the greatest impact on stakeholders within the scope of the assessed activity or project.



Outputs of Stage 2

1. The objective, scope, and target audience of the assessment.
2. An impact pathway that connects the organization's activities with relevant impacts.
3. Key social and natural capital issues associated with the organization's activities.



Stage 3 Measure and Value

Objective

To measure and evaluate social and natural capital impacts by identifying suitable indicators and collecting relevant data.

Step 5 Measure impact drivers and changes in the state of natural and social capital

Prior to evaluating the impact of social and natural capital, impact drivers must be considered in order to decide on the most appropriate indicators to measure impacts and changes.

Actions

5.1 Consider impact drivers

5.1.1 According to the impact pathway in 4.1, the organization should consider which impact drivers are associated with each of the activities to be assessed. These may proceed from the activities' inputs and outputs. Therefore, this step involves the identification of impact drivers of activities related to social and natural capital in order to determine appropriate indicators.

5.1.2 Select quality indicators that can reflect the status of activities. A good indicator should carry the following characteristics:

Specific : Indicators should reflect the information to be measured, be easy to understand and communicated to relevant parties.

Measurable : Indicators should be measurable and verifiable.

Attainable : Indicators should be achievable.

Relevant : Indicators should reflect the desired information and outcomes.

Time-bound : Indicators should have a clear time frame and allow progress to be tracked at a desired frequency.

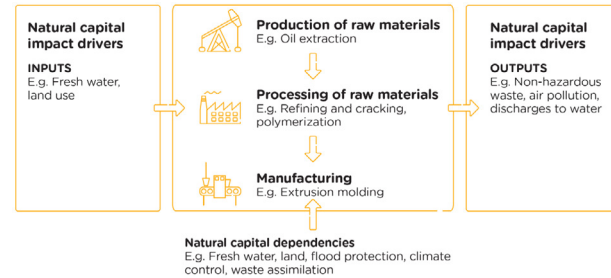


Figure 9 Diagram showing impact drivers associated with the production process of a plastic cup (Natural Capital Protocol, 2016)

5.1.3 Collect data within the scope of assessment and according to the indicators selected in 5.1.2 while taking into account:

- (1) Data accuracy
- (2) Data quality and verifiable data collection process
- (3) Collection of secondary data, if necessary, to support primary data collected, e.g., data from research, publications, reports, past audit results, etc., as well as audits and verifications of the estimation methods and outcomes.

Table 2 Examples of Impact Drivers and Indicators

Activity	Impact Drivers	Category	Indicators
Social & Human Capital			
Safe driving training	Participants receive knowledge on driving safety	Output	Number of participants who passed the test (persons per year)
Sale of products in the community	Gathering of community members	Input	Number of participants (persons per year)
การจำหน่ายสินค้าในชุมชน	รายได้จากการจำหน่ายสินค้า	Output	Amount of income (THB per year)
Natural Capital			
Livestock farming	Land use	Input	Forest area used for farming (square meters)
	Wastewater	Output	Amount of nitrogen and phosphorus content in water (ml. per cubic meter)
Mangrove planting	Number of mangroves	Output	Number of trees planted (trees per rai)
Coffee roasting process	Electricity consumption	Input	Amount of electricity used (kilowatts per hour)

More information on indicators is available at <https://socialimpact.nia.or.th/>

5.2 Measure changes in social and natural capital

5.2.1 Identify changes in social and natural capital related to the organization's activities and impact drivers. According to the impact pathway in 4.1, the outcomes are the changes that have occurred.

5.2.2 Select social and natural capital changes based on:

- (1) Scope of assessment and available data
- (2) Expenses in obtaining information sources
- (3) Appropriate method
- (4) Time and resources used for the assessment



Table 3 Examples of social and natural capital changes

Impact Drivers	Indicators	Outcomes
Social & Human Capital		
Participants gain knowledge on driving safety	Number of participants who passed the test (persons per year)	Reduced road accidents
Gathering of community members to sell products	Number of participants (persons per year)	Participation of community members
Income from product sales	Amount of income (THB per year)	Better living of community members
Natural Capital		
Land use for livestock farming	Forest area used for farming (square meters)	Physical changes and local biodiversity
Wastewater	Amount of nitrogen and phosphorus content in water (ml. per cubic meter)	Physical changes in water source
Number of mangroves	Number of trees planted (trees per rai)	Carbon dioxide absorption from forests
Electricity consumption in coffee bean production	Electricity consumption (kilowatts per hour)	GHG emissions

Table 4 Examples of social capital changes measurement and estimation methods

Social Capital Changes	Methods of Measurement/ Estimation
Having sufficient income to meet expenses	<ul style="list-style-type: none"> Increased community income
Value of agricultural production	<ul style="list-style-type: none"> Higher agricultural product prices per unit
Lost time due to illness	<ul style="list-style-type: none"> Higher agricultural product prices per unit
Lost time due to work-related accidents	<ul style="list-style-type: none"> Reduced number of accidents

Table 5 Examples of natural capital changes measurement and estimation methods

Natural Capital Changes	Methods of Measurement/Estimation
Land cover	<ul style="list-style-type: none"> Density, age, distribution of plants species
Changes in the number of pollutants in air/water/soil	<ul style="list-style-type: none"> Measuring water, air, soil quality
Changes in water shortage conditions	<ul style="list-style-type: none"> Measuring water stress and water shortage indices Increased or decreased demand for water
Changes upon flooding	<ul style="list-style-type: none"> Flooding frequency and actual damage Assessment of potential risks
Changes upon erosion	<ul style="list-style-type: none"> Measuring topsoil loss, sediment increase Estimating relevant factors, such as soil type, climate, soil management
Changes in the number of aquatic animals in water	<ul style="list-style-type: none"> Capture amounts or ecological surveys

Note Caution should be exercised when measuring or estimating as the changes may not be caused by the organization alone.

5.2.3 Choose a method to measure the outcomes or impacts in social and natural capital. In this step, the organization must select an appropriate method for measuring changes in social and natural capital.

(1) Measuring changes in social capital In some cases, changes in social capital can be directly measured in terms of monetary values as shown in Table 4.

However, there may be difficulties in some cases due to the abstract nature of several social outcomes, e.g., better family relationships, environmental awareness, increased unity in the community, forests with high biodiversity, students not having to drop out of school due to poverty, people with disabilities gaining more social confidence, etc. Therefore, a “financial proxy” must be applied in assessing these outcomes. Consequently, the organization must exercise caution in selecting proxies closest to the actual value.

Many social outcomes, although not directly monetary, are related to elements that have a market price. In such cases, the organization can adopt the market price to assess the monetary value of the outcome; for instance, an indicator of “more abundant neighboring forests” is the community’s ability to find more forest products which have a market price, e.g., mushrooms, honey and Melientha suavis, or the indicator on “reducing the number of trips to the city for medical consultations” where each trip bears a market price, e.g., bus fares, etc.

For indicators without a market price, economic methodologies used in cost-benefit analysis may be applied. This Guideline specifies the methods that the organization can adopt from the cost-based approaches shown in Table 5 describing various methods of impact assessment.

(2) Measuring natural capital changes Several methods are available for measuring and evaluating natural capital changes. This Guideline will present the main methods for estimating changes.

Step 6 Value impacts and/or dependencies

This step features the valuation of impacts. In doing so, the organization should select a valuation approach that is most appropriate, which may involve quantitative, qualitative, or monetary techniques, depending on the objective, scope of assessment, time, and available resources. The organization should consider the data on indicators and resulting changes implemented in Step 5.

Actions

6.1 Select an impact valuation technique appropriate to the objective, taking into account whether the organization wishes to evaluate in terms of quality, quantity or monetary.

(1) Qualitative Valuation Techniques

Qualitative valuation is the scale of costs or benefits expressed through qualitative, non-numerical terms. It is descriptive and can convey perceptions of change, e.g., increased air pollution, people feeling safer in the society, etc.

(2) Quantitative Valuation Techniques

Quantitative valuation expresses the value of impacts in numerical, non-monetary terms, e.g., tons of pollution reduced, number of people benefiting from social activities, etc.

(3) Monetary Valuation Techniques

Monetary valuation translates quantitative data on impacts into monetary figures, e.g., income, expenses, etc.

Table 6 Impact valuation techniques

Techniques	Description	Desired Data
Qualitative Valuation		
Opinion surveys	Surveys designed to represent views through a series of questions	Example of stakeholder survey data sampling
Deliberative approaches	Group discussions, brainstorming sessions, workshops, etc.	Input from stakeholders
Quantitative Valuation		
Structured surveys	1:1 quantitative questionnaire employing a set of questions with closed response options (Y/N, scoring, numerical choices) that allow for statistical analysis	Stakeholder information to determine sampling frame
Indicators	Various indicators can be used to quantify information	Information on all parameters to be valued
Multi-criteria analysis (MCA) using scoring and weighting	Selecting a range of parameters and ranking their value through scoring and weighting	Information on all parameters to be valued
Monetary Valuation		
● Market-based Approaches		
Market and Financial Prices	<ul style="list-style-type: none"> Costs/prices paid for goods and services traded in markets, e.g., timber, carbon, value of water bill, etc. Financial information, e.g., estimated financial value of liabilities and assets Other interpretations of market data, e.g., opportunity costs, mitigation costs, cost of illness. 	<ul style="list-style-type: none"> Market prices of goods or services Costs involved to process and bring the product or service to market (e.g., a training course)
Production Function	The effect of changes in non-market factors on the value of production output	● Data on changes in the output of a product
● Cost-based Approaches		
Compensation Costs	The cost of compensating for experiencing a negative impact	ค่าชดเชยจากรัฐกิจหรือจากแหล่งสาธารณะ

Techniques	Description	Desired Data
Monetary Valuation		
• Cost-based Approaches		
Defensive Expenditure or Prevention Cost Method (PCM)	The value paid to mitigate a risk or to prevent a problem, e.g., expenditure on safety equipment that reduces risk of injury or mortality	Data on the price of protective equipment
Damage/Repair/Replacement Cost	Cost of restoring a negative impact to its previous condition	Data on actual or estimated repair costs
• Revealed Preference Techniques		
Travel Cost Method (TCM)	The difference in property prices or wage rates can indicate the different qualities or attributes. In the case of wages, this could include skills, experience, and training, e.g., measuring the premium of house prices with improved surrounding, measuring the increased labor costs of jobs that pose health risks, etc.	Time and cost of travelling
Hedonic Price Method	The difference in property prices or wage rates can indicate the different qualities or attributes. In the case of wages, this could include skills, experience, and training, e.g., measuring the premium of house prices with improved surrounding, measuring the increased labor costs of jobs that pose health risks, etc.	<ul style="list-style-type: none"> • Information related to house prices and related quality effects • Information related to wage rates • Expenses for training, education or cooperation with other organizations which leads to increased productivity
Environmental quality as a factor input	A valuation that considers natural resources and the environment as inputs for the production process, e.g., water pollution will raise the cost of tap water production because the cost of water treatment is increased compared to cases without water pollution, etc.	Increased production costs or expenses
Cost of Illness	The study of the medical treatment cost of an individual. The cost of illness consists of direct and indirect costs due to illness, injury, or fatality. Direct costs include the costs of diagnosis, treatment, and recovery. Indirect costs include the opportunity cost of not working or costs incurred as a result of reduced work capacity caused by illness, etc.	<ul style="list-style-type: none"> • Cost of medical expenses • Opportunity costs

6.2 Conduct an impact valuation. The organization must collect relevant information according to the appropriate valuation technique selected.



Outputs of Stage 3

1. Appropriate indicators
2. Primary and secondary information essential and relevant to the indicators
3. Appropriate impact valuation technique
4. Outcome of impact valuation



Stage 4 Apply

Objective

Interpret the impact valuation results from activities or projects that the organization has carried out to facilitate business decision-making.

Step 7 Interpret and test results

Once the organization has completed the impact valuation, result translation is another step that allows the organization to effectively analyze, interpret and communicate outcomes to target audiences as well as the positive and negative impacts on stakeholders.

Actions

7.1 Validate results. Based on the impact valuation results, some cases may require multiple valuation techniques and additional supporting information in order to obtain the most appropriate approach and comprehensive outcomes. The organization should also ensure thorough data cross-checking with other reference sources to achieve proxies with key qualities such as credibility, accuracy, etc.

In this step, caution should be exercised as the value of activities with positive net benefits may have hidden negative impacts, e.g., employment and paying of wages create value for workers but working conditions are unfavorable. Therefore, in addition to observing the total impact value, the organization must also take into account other elements as well as affected parties.

7.2 Consider the discount rate in the case of monetary valuation Where social valuation relates to business benefits, it is appropriate to use the business's normal financial discount rate to express future costs or benefits. Societal discount rates vary but are usually lower than

normal financial discount rates. Where future costs or benefits are concerned, it is appropriate to apply a discount rate that reflects the balance for current consumption versus future consumption.

7.3 Test key assumptions Some estimations are involved with social impact measurement and valuation. It is critical to understand and clearly communicate the accuracy and reliability of the results so that it can be integrated into business decisions, particularly upon using monetary valuation which produces vastly different results depending on the reference value chosen. Therefore, in cases of uncertainty, it is common to choose the most reasonable assumptions.

Furthermore, in the case of monetary valuation, the values may be sensitive to changes that are beyond the business's control, e.g., exchange rate fluctuations, inflation and purchasing power parity. Businesses should conduct a sensitivity analysis to test assumptions and communicate the results of the sensitivity analysis alongside the assessment results.

7.4 Validate and verify the assessment process and results In case the organization needs to communicate the assessment results to certain audiences or external parties, the verification of the evaluation process and the results is required in order to assure internal and external stakeholders that the data and methods are appropriate and that the results are sufficiently effective for use in decision-making.

Step 8: Apply results to key business decisions

The impact valuation of social and natural capital is useful for decision-making and other intended use by organizations, investors, and governments. Nevertheless, integrating social and human capital into business processes can be time-consuming.

Actions

8.1 The organization should verify whether the assessment results has met the objective and whether it is necessary to make changes to an activity or a plan of action as well as measure the contribution of the assessment to the business's strategy or targets.

8.2 Integrate social and natural capital into business processes. The organization may commence with an internal pilot study project or activity. With more study and understanding, it can be expanded to include other value chains. Some examples of social and natural impact integration into business processes include strategic planning and goal setting, impact assessment, risk assessment, etc.

8.3 The organization should prioritize the importance of social capital impact assessments by addressing areas of high risk, high interest to stakeholders or of high importance to the business, etc.



Outputs of Stage 4

1. Comparison of impact valuation results against business targets and outcomes.
2. Corporate impact valuation plan.
3. Corporate impact valuation process.

Key Definitions

Key Word	Description
Social capital	Social capital is a form of organizing featuring trust, norms and networks that enhances the efficiency of societies in their joint activities (Robert Putnam, 1993).
Human capital	Social capital is a form of organizing featuring trust, norms and networks that enhances the efficiency of societies in their joint activities (Robert Putnam, 1993).
Natural capital	The stock of renewable and non-renewable natural resources (e.g., plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people (Natural Capital Protocol, 2016).
Social and human capital impact	A persistent change in well-being experienced by a person or group of people that occurs as a result of an activity; it can be positive, negative, intended or unintended (Social and Human Capital Protocol, 2019).
Natural capital impact	The negative or positive effect of business activity on natural capital (Natural Capital Protocol, 2016).
Impact drivers	Factors relevant to impact assessment, including factors used as an input to production, e.g., number of skilled staff, and as a non-product output of a business activity, e.g., health and safety data, NOx emissions, etc. (adapted from the Social and Human Capital Protocol, 2019).
Impact pathway	An impact pathway describes how, as a result of a specific business activity, a particular impact driver results in changes in natural capital and how these changes in natural capital affect different stakeholders (Natural Capital Protocol, 2016).
Measurement	The process of determining the amounts, extent and conditions or changes in social and human capital through the collection of qualitative and/or quantitative data. (Social & Human Capital Protocol, 2019)
Valuation	The process of estimating the relative importance, worth or usefulness of social and human capital to people or society, or to a business in a particular context; valuation may involve qualitative, quantitative, or monetary approaches, or a combination of these. (Source: Social & Human Capital Protocol, 2019)

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Case Study: Economic, Social, and Environmental Impact Valuation

Ban Thammachat Lang Drinking Water Project, Trat Province

Charoen Pokphand Foods Public Company Limited (CPF)'s Eastern Shrimp Hatchery in Trat province is located in an area with limited drinking water supply. In the past, it had to purchase drinking water from local vendors and was met with issues of supply inadequacy and long delivery distance. In order to overcome such problems, CPF surveyed Ban Thammachat Lang Community and discovered that it had the potential to produce drinking water and that a Reverse Osmosis (RO) unit was already installed in the Community. However, the community members lacked management skills and were, thus, unable to proceed further. Therefore, CPF intervened and provided support by collaborating with the Community to establish a new drinking water production plant that meets standards and safety requirements. As a result, the Community was able to produce drinking water for commercial distribution. This became a supplementary occupation that generated income for families and financial circulation within the Community.

Objectives

1. To improve the quality of life of community members.
2. To generate income for the Community.
3. To empower the Community's self-reliance.

Risk and Opportunity Assessment

During the Project, risks and opportunities were assessed to support decision-making on impact assessment.

Risks	Opportunities
<p>Personnel</p> <ul style="list-style-type: none"> • Community members' lack of knowledge on the management of a drinking water production plant that meets standards <p>Operational</p> <ul style="list-style-type: none"> • Lack of efficient business management skills • Increased water consumption <p>Marketing</p> <ul style="list-style-type: none"> • Lack of knowledge about marketing channels for drinking water distribution <p>Legal and Regulatory</p> <ul style="list-style-type: none"> • Wastewater discharge from the production process that may affect the environment 	<p>Personnel</p> <ul style="list-style-type: none"> • CPF's mentorship on management and support in establishing a "community drinking water enterprise" • CPF's support in terms of personnel to enhance production systems and quality control to meet FDA standards <p>Operational</p> <ul style="list-style-type: none"> • Community members' access to clean and safe drinking water • Model for other communities experiencing problems • Development of a learning resource and tourism learning base, "Ban Thammachat Lang Community-based Tourism Enterprise"

According to the risk and opportunity assessment, the Project can benefit the Community both economically and socially. Furthermore, it can be developed into a learning source and a pilot project for the further development of other communities.

Scope of Assessment

The scope of assessment for Ban Thammachat Lang Drinking Water Project in 2020-2021 takes into account all groups of stakeholders, including those who are directly and indirectly affected as well as those who can identify the changes incurred from the project implementation:

1.CPF

- Provides knowledge support on management
- Provides farming equipment
- Inspects water quality by CPF Laboratory

2.Ban Thammachat Lang Community

- Community members form a group to jointly invest in drinking water production

3.National Village Fund

- Provides budget to improve the drinking water

4.Ban Thammachat Lang Sub-district Health Promoting Hospital

- Health checkup for the drinking water production

5. Public Private Partnership (PPP)

- Provides Reverse Osmosis (RO) water purifiers

The relationship between activities from the project implementation and changes in the economic, social, and environmental aspects is shown in the following impact value chain.

DIMENSIONS	Input	Activities	Output	Outcome	EXTERNALITIES	Indicators
Economic	Knowledge of drinking water production, community members, drinking water production unit, equipment, investment	Production of drinking water	Quantity of drinking water produced	Community members have jobs and higher income as a result of employment and drinking water production	Better well-being of community members (+)	- Higher average income per household (THB per year) - Lower debt per household (THB per year)
Economic	Bottled water, containers, community members, method	Sale of drinking water	Quantity of drinking water sold to community members	Reduced community expenses as a result of buying drinking water from the Project	Better well-being of community members (+)	- Lower expenses per household (THB per year) - Number of members who form a group to buy drinking water - The enterprise's income from sales of drinking water (THB per year)
DIMENSIONS	Input	Activities	Output	Outcome	EXTERNALITIES	Indicators
Social	Knowledge of drinking water production	Providing knowledge on the production of clean drinking water	Clean and safe drinking water	Standard certification from the Department of Medical Sciences, Ministry of Public Health, Chonburi Province	Community members' access to a clean and safe water source (+)	- Number of community members suffering from illnesses related to drinking - Lower medical expenses per person per year
Social	Knowledge of correct ergonomics at work	Providing knowledge on correct ergonomics at work	- Using a conveyor and appropriate equipment to transfer and lift water containers - Number of employees receiving knowledge	Staff work according to ergonomic principles	Employees do not suffer from work-related illnesses (+)	- Lower medical expenses per person per year - Number of work-related accidents (person)
DIMENSIONS	Input	Activities	Output	Outcome	EXTERNALITIES	Indicators
Environmental	Water from raw water sources, production equipment, containers	Drinking water production process	Increased electricity consumption in the production process	Quantity of GHG emissions	Increased GHG in the atmosphere (-)	Electricity consumption (KWh)
Environmental	Drinking water, drinking water transport vehicles	Drinking water transportation process	Fuel energy consumption in transportation	Quantity of GHG emissions	Increased GHG in the atmosphere (-)	Fuel consumption
Environmental	Water from raw water sources, production equipment, containers	Drinking water production process	Wastewater from RO system	Quantity of wastewater from RO system	Environmental impacts (-)	Quantity of wastewater from RO system

Figure exhibiting the impact value chain of Ban Thammachat Lang Drinking Water Project

The impact value chain indicates the following outcomes from the project implementation:

Economic	Social	Environmental
1. Community income from employment and sales of drinking water (+) 2. Reduced community expenses as a result of buying drinking water from the Project (+)	1. Community members' access to a clean and safe water source (+) 2. Employees do not suffer from work-related illnesses (+)	1. GHG emissions from electricity consumption (-) 2. GHG emissions from fuel consumption in transportation (-) 3. Wastewater discharge from RO system (-)

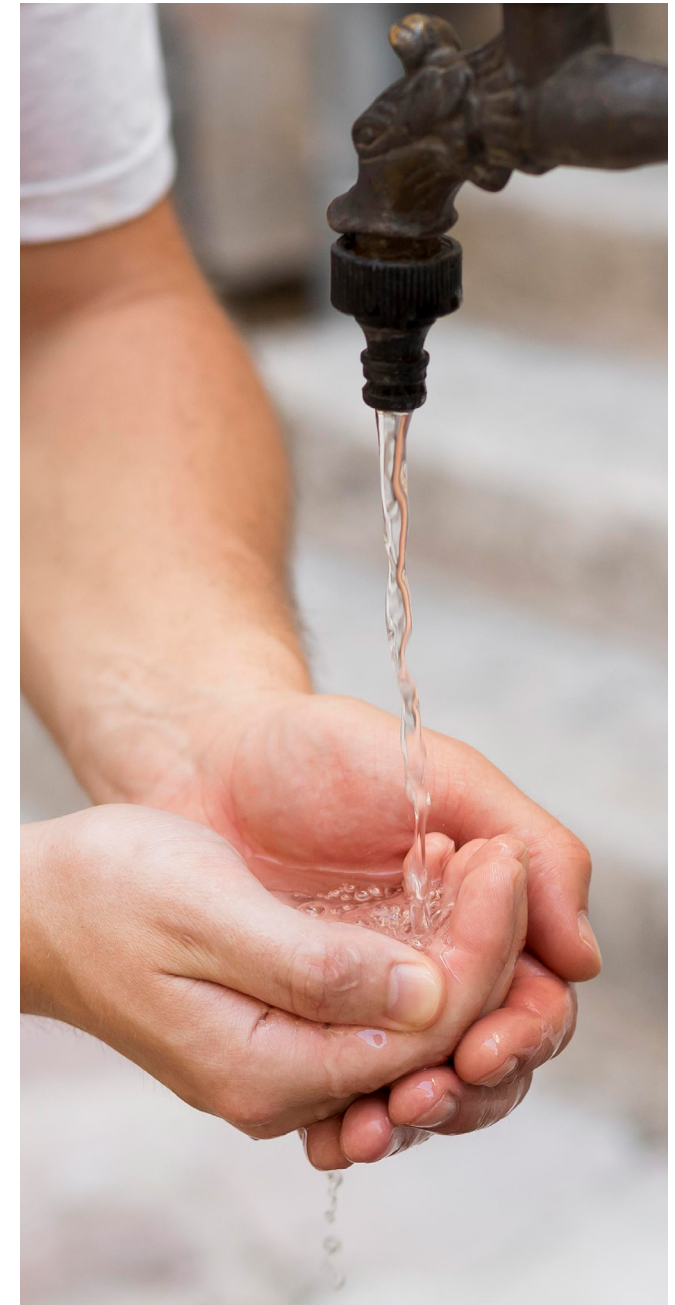
Determining Indicators

Once the outcomes and externalities of the Project's activities have been identified, they are used to determine the appropriate indicators:

Activities	Impact Drivers	Indicators
Drinking water production	Community members' income	<ul style="list-style-type: none"> - Higher average income per household (THB per year) - Project members' income (THB per year) - Number of members who form a group to buy drinking water (person) - Income for the Village Fund (THB per year)
Sales of drinking water	Reduced expenses from purchasing drinking water	<ul style="list-style-type: none"> - Lower average expenses per household (THB per year)
Providing knowledge on the production of clean drinking water	Clean and safe drinking water	<ul style="list-style-type: none"> - Number of community members with illnesses related to drinking - Lower medical expenses per person per year
Providing knowledge on correct ergonomics at work	Staff follow ergonomics principles at work	<ul style="list-style-type: none"> - Lower medical expenses per person per year - Number of employee work-related accidents (person)
Drinking water production process	Electricity	Electricity consumption (KWh)
Drinking water production process	Fuel energy	Fuel consumption
Drinking water production process	Wastewater from RO system	Wastewater quantity from RO system

Collect data within the scope of assessment and based on the indicators. Guidelines on data collection from different sources are as follows:

- 1) Formulate a questionnaire to interview stakeholders, namely working groups, community members who jointly invest in drinking water production, community members who purchase drinking water.
- 2) Internal data sources, namely details of operations, Project performance, overhead costs.
- 3) External data sources, namely medical costs related to back pain per person per year, electricity costs, wastewater treatment costs.



Measuring Changes

Measure and compare changes in data collected in 2020 and 2021 with data from the base year 2019. However, as the Project had not yet commenced in 2019, there is insufficient data for such comparison. Therefore, data from 2020 and 2021 are used in the assessment. The changes are measured according to the following

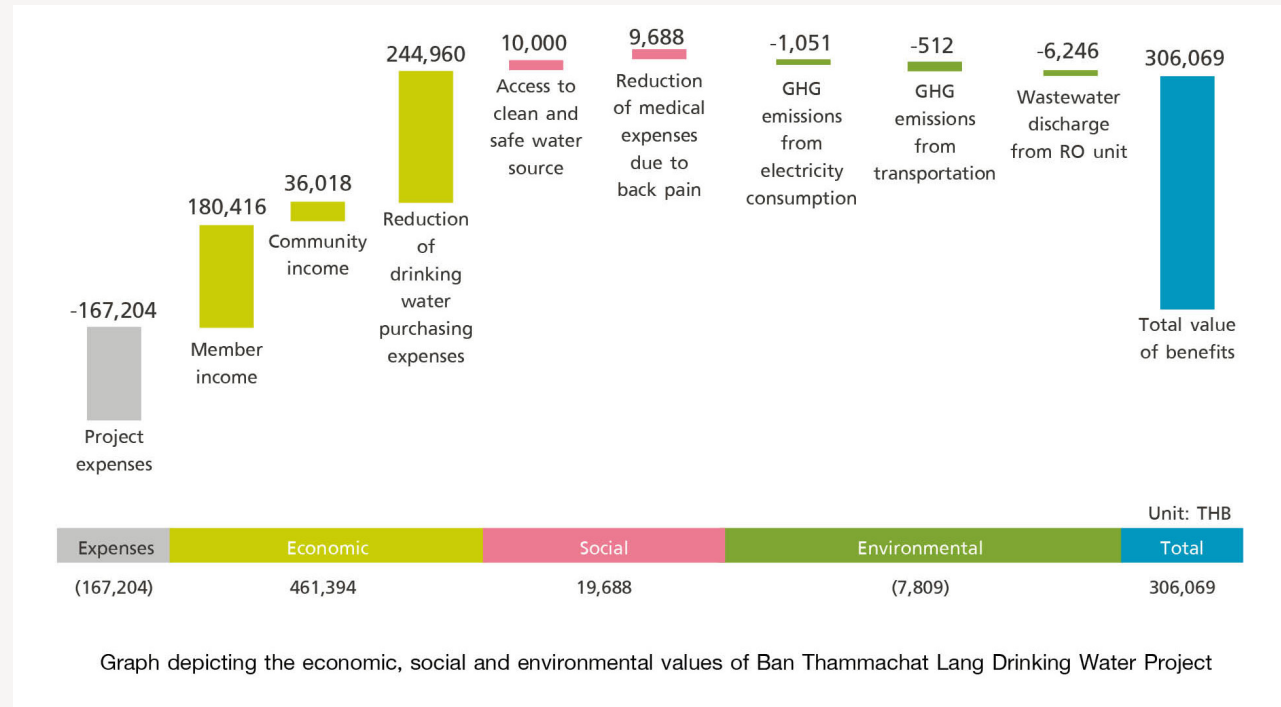
Indicators	Outcomes/ Changes
Project members' income	Higher income
Income for the Village Fund	Higher income
Reduced community expenses as a result of buying drinking water from the Project	Lower expenses
Community members' access to a clean and safe water source	Lower medical expenses as a result of clean drinking water consumption
Reduced medical expenses due to back pain	Lower medical expenses due to back pain
GHG emissions from electricity consumption	Use of electricity in the production process
GHG emissions from fuel consumption in transportation	Use of fuel energy in water transportation
Wastewater discharge from RO system	Wastewater discharge

Impact Valuation

The Project's impact valuation uses monetary valuation techniques and employs reference values for any indicators where actual income or expenditure figures cannot be collected.

Indicators	Outcomes/ Changes	Financial Proxy
Project members' income	Higher income	Actual income
Income for the Village Fund	Higher income	Actual income
Reduced community expenses as a result of buying drinking water from the Project	Lower expenses	Actual expenses
Community members' access to clean and safe water	Lower medical expenses as a result of clean water consumption	Actual medical expenses (Data from interviews)
Lower medical expenses due to back pain	Lower medical expenses due to back pain	Cost of Illness
GHG emissions from electricity consumption	Electricity consumption in the production process	Social Cost of Carbon
GHG emissions from fuel consumption in transportation	Fuel consumption in water transportation	Social Cost of Carbon
Wastewater discharge from RO system	Wastewater discharge	Wastewater treatment costs based on research data

Results of the Project's Impact Valuation 2020-2021



Benefits

Economic Value

Ban Thammachat Lang Drinking Water Project has contributed directly and indirectly to the development of the local economy in terms of creating employment, generating income for the Village Fund, and reducing water purchasing expenses for community members. The value of its economic contribution stands at 461,394 THB.

Social Value

The Project's social contribution derives from the valuation of impacts on community members who have gained access to clean and safe water supply as well as the reduction of medical expenses due to back pain caused by lifting water containers. The social value stands at 19,688 THB.

Environmental Value

The Project's negative impacts are the result of greenhouse gas emissions from electricity-consuming activities, fuel consumption from transportation, and wastewater discharge from drinking water production processes, causing an impact worth 7,809 baht.

Upon comparing the Project's economic, social, and environmental valuation to the 167,204-THB expense incurred from the entire project implementation, it was found that the Ban Thammachat Lang Drinking Water Project has directly and indirectly generated positive contribution worth 306,069 THB.

In order to reaffirm the reliability of the evaluation results prior to public release, the Project has contracted a third-party verification to certify said information.

The results of the economic, social, and environmental valuation have indicated opportunities for improvement and additional value creation in various aspects which can be beneficial to the locals of Ban Thammachat Lang and neighboring communities as well as opportunities to expand knowledge in the form of prototype projects for other potential areas.



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