Kingdom of Bhutan
Ministry of Finance

Data Collection Survey for Reforming Corporate Governance and Enhancing Productivity of State-Owned Enterprises in the Kingdom of Bhutan

Final Report

February 2025

Japan International Cooperation Agency (JICA)

Oriental Consultants Global Co., Ltd.
Sanyu Consultants Inc.
Japan Productivity Center

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List of Abbreviations

ABU	Asia Pacific Broadcasting Union
ADB	Asia Development Bank
AI	Artificial Insemination
ALIC	Agriculture and Livestock Industries Corporation
ASEAN	Association of Southeast Asian Nations
ASF	African Swine Fever
BAFRA	Bhutan Agriculture and Food Regulatory Authority
BAIL	Bhutan Argo Industries Limited
BBPL	Bhutan Board Products Limited
BBSCL	Bhutan Broadcasting Service Corporation Limited
BCCL	Bhutan Carbide and Chemicals Limited
BDBL	Bhutan Development Bank Limited
BES	Bhutan Ecological Society
BFAL	Bhutan Ferro-Alloys Limited
BFDA	Bhutan Food and Drug Authority
BIDC	Bhutan Industrial Development Corporation
BIL	Bhutan Insurance Limited
BIMSTEC	Bay of Bengal Initiative for Multi-Sectorial Technical and Economic Cooperation
BKD	Bacterial kidney disease
BLDCL	Bhutan Livestock Development Corporation Limited
BOBL	Bank of Bhutan Limited
BOD	Board of Directors
BPCL	Bhutan Power Corporation Limited
BS	Balance Sheet
BSC	Balanced scorecard
BSDC	Bhutan Sustainable Development Corporation
BTL	Bhutan Telecom Limited
CCP	Critical Control Point
CCTV	Closed-Circuit Television
CEO	Chief Executive Officer
CF	Cash Flow
CFO	Chief Financial Officer
CGC	Corporate Governance and Corporate Social Responsibility Code of Bhutan
CGG	Corporate Governance Guidelines
COVID-19	Coronavirus disease 2019
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
CSI	Cottage and Small Industries
DANIDA	Danish International Development Agency
DGPC	Druk Green Power Corporation Limited
DHI	Druk Holding and Investments
DOC	Day Old Chicks

DOL	Department of Livestock
Druk Air	Druk Air Corporation Limited
EHN	Epizootic Hematopoietic
EM	Effective Microorganism
EP	Extruded Pellet
EPA	Economic Partnership Agreements
ESP	Economic Stimulus Plan
EU	European Union
FAO	Food and Agriculture Organization
FCBL	Food Corporation of Bhutan Limited
FCR	Feed Conversion Ratio
FIA	Fiscal Incentives Act
FIFO	First-In First-Out
FMCL	Farm Machinery Corporation Limited
FP	Finished Product
FS	Financial Statement
F/S	Feasibility Study
FT	Food Technician
FTA	Free Trade Agreements
FY	Fiscal Year
GAP	Good Aquaculture Practice
GBCL	Green Bhutan Corporation Limited
GCBS	Gedu College of Business Studies
GDP	Gross Domestic Product
GM	General Manager
GNH	Gross National Happiness
GOI	Government of India
GST	Goods and Services Tax
HACCP	Hazard Analysis and Critical Control Points
HQ	Headquarters
HR	Human Resources
HRC	Human Resources Committee
ICT	Information and Communications Technology
IFC	International Finance Cooperation
IHN	Infectious Hematopoietic Necrosis
ILPD	Integrated Livestock Production Division
IT	Information Technology
ITA	Income Tac Act
ISA	Infectious Salmon Anaemia
IPN	Infectious Pancreatic Necrosis
IPO	Initial Public Offering
JA	Japan Agricultural Cooperative

JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
JPC	Japan Production Center
JSF	Japan Special Fund
KBS	Korean Broadcasting System
KPI	Key Performance Indicator
LDC	Least Developed Countries
LPG	Liquefied Petroleum Gas
LPO	Livestock Production Officer
LPVAD	Livestock Products Value Addition Division
MG	Minimum Guarantee
MM	Man Month
MOENR	Ministry of Energy Natural Resources
MOAL	Ministry of Agriculture and Livestock
MOF	Ministry of Finance
MQ	Margine Quantity
MT	Mega Ton
MW	Mega Watt
N/A	Not Applicable
NGO	Non-Government Organization
NILF	National Integrated Livestock Farm
NKU	National Kaizen Unit
NRCA	National Research Centre for Aquaculture
NRCR&LF	National Research and Development Center for Riverine & Lake Fisheries
NSF	National Sanitation Foundation
NU	Ngultrum
OD	Operation Director
OJT	On the Job Training
OMV	Oncorhynchus Masou Virus
PDCA	Plan Do Check Action
PFA	Public Financial Act
PGS	Price Guarantee Scheme
PHD	Doctor of Philosophy
PL	Profit and Loss statement
PPP	Promote Public-private Partnerships
PPT	Power Point
PS	Parent Stock
Q&A	Question and Answer
QC	Quality Control
R&D	Research and Development
RBP	Royal Bhutan Police
RCA	Research Center of Aquaculture

RGOB	Royal Government of Bhutan
RICB	Royal Insurance Corporation Bhutan
RM	Raw Material
RNR	Renewable Natural Resources
ROI	Return on Investment
SAARC	South Asian Association for Regional Cooperation
SCD	Systematic Country Diagnostic
SDD	Sales and Dealership Division
SE	State Enterprises
SMCL	State Mining Corporation Limited
SME	Small and Medium Enterprises
SOEs	State-Owned Enterprises
SOPs	Standard Operating Procedures
STEM	Science, Technology, Engineering and Mathematics
SVC	Spring Viremia of Carp
SWOT	Strength, Weaknesses, Opportunities, Threats
TA	Technical Assistance
TMR	Total Mixed Rations
TO	Technical Officer
TOT	Training of Trainers
TPP	Trans-Pacific Partnership
TVET	Technical & Vocational Education and Training
VHS	Viral Hemorrhagic Septicemia
WBS	Work Breakdown Structure
WIP	Work in Progress
WS	Workshop
WTO	World Trade Organization

CHAPTER 1. OUTLINE OF THE SURVEY

1.1 Background and Purpose of the Survey

1.1.1 Background of the Survey

Bhutan's industrial structure consists of approximately 19% of GDP in primary industries (Agriculture, Livestock etc.), approximately 34% in secondary industries (hydroelectric power generation, construction, etc.), and approximately 47% of GDP in tertiary industries (wholesale, retail, tourism, etc.). The real GDP growth rate has remained at a high level of 6.1% on average annually from 2010 to 2019. Due to the impact of COVID-19, real GDP growth rate significantly decreased from 5.8% in 2019 to -10.1% in 2020, but as a result of implementing economic recovery measures (Economic Contingency Plan) centered on the construction industry, tourism industry, and agriculture, the GDP growth rate is on track to recover, with 5.2% in 2022 (World Bank)[1] . On the other hands, due to active and strategic public investment, the fiscal deficit for the 2022/23 budget has reached its largest ever (-9.4% of GDP), and there is also the problem of human resources leaving the country due to high unemployment rates among the working-age population and young people. In order to ensure sound fiscal management, it fundamentally improves a system that relies on revenues from hydroelectric power generation projects and is necessary to increase revenue based on the premise of securing employment.

In this economic climate, State-Owned Enterprises (SOEs) play a major role in key areas of economic activity in Bhutan, including banking, energy and power generation, real estate, postal services, transport and aviation, and communications. The majority of the 30 SOEs (excluding those in which the Bhutanese government is a minority shareholder) were established in the past 20 years, and the total assets of the 29 companies, excluding the state-owned investment company (Durk Holding and Investment: DHI), has grown to scale equivalent to 207% of Bhutan's GDP (319 billion Ngultrum: Nu in 2021). However, there are some SOEs who have difficulty achieving net profits in the short term, and some SOEs whose financial standing has deteriorated due to non-strategic business expansion or diversification of activities. Thirteen SOEs out of 29 made losses, and overall debt was at a critical level of approximately 30% of GDP. In response, subsidies are being reduced at a pace of about 3% per year by the government of Bhutan, but some SOEs need to improve their financial standing. As a first step, Bhutan Livestock Development Corporation Limited (BLDCL), which is one of the five SOEs with poor annual profits under the Ministry of Finance (MOF) , has been set up as a precedent case prior to reforming other SOEs. After the detailed review of the BLDCL business and financial structure, identifies issues, a short-, medium-, and long-term organizational reform will be implemented.

[1] https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=BT

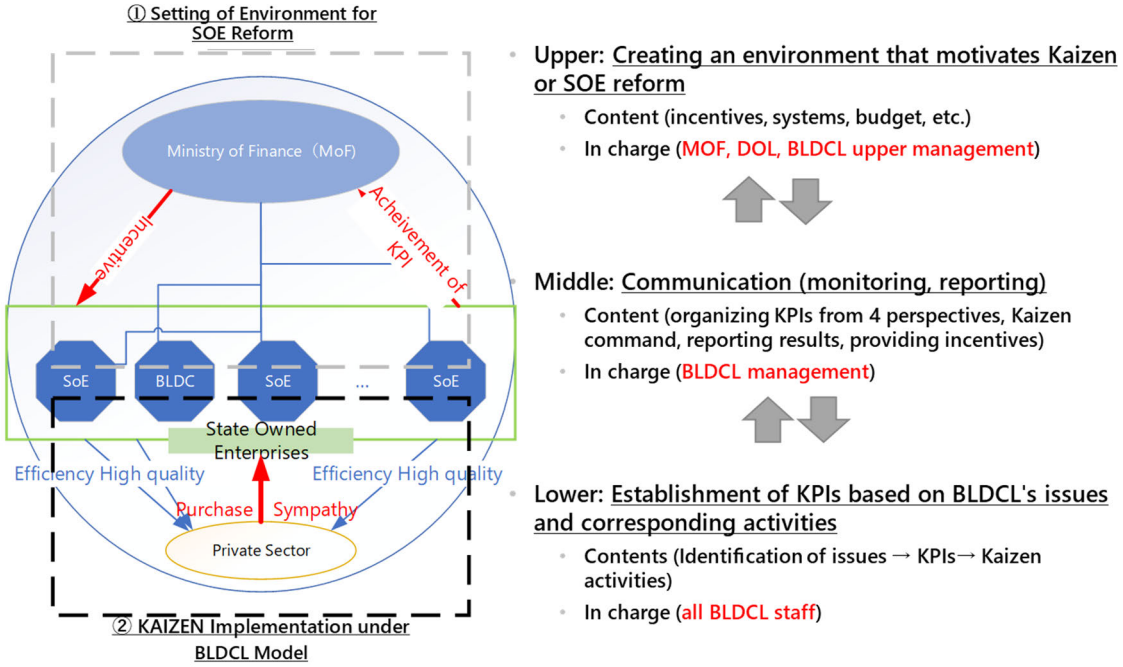
1.1.2 Purpose of the Survey

The financial condition of SOEs under the MOF of Bhutan that have been in the red in recent years, will be analyzed in the Survey. It will be also proposed a concrete policy action required for streamlining, rationalization, and privatization of all loss-making SOEs through the trial promotion of reforms to improve the profitability of BLDCL, which is being promoted by the MOF, and derive a proposal for a JICA cooperation program that will contribute to the implementation of these policy actions.

1.2 Basic Concept of Conducting the Survey

Due to concerns about the financial soundness of SOEs, the MOF of Bhutan is considering privatizing BLDCL, placing the highest priority on improving the efficiency of the company's operations, and is implementing reforms at BLDCL in three stages: short-term, medium-term, and long-term.

In this Survey will support a part of the reform of SOEs in the two layers shown in the figure: (1) setting up the environment for implementing kaizen and (2) implementing kaizen in the BLDCL model as shown in Figure 1-1.



Source: JICA Survey Team

Figure 1-1 Concept of Supporting SOE Reform

1.2.1 Setting the Kaizen Implementation Environment

In this survey, the ideal form of environmental improvement (including incentives) necessary for the SOE reform is explained to the MOF, which is promoting the SOE reform, through seminars, online conferences, Japan invitation program, etc. In addition, through seminars, etc., the direction of the projects that have been set and implemented in the short and medium term and the necessary of key performance indicators (KPIs) were explained to Bhutanese government side using the concept of the Balanced Scorecard (BSC).

1.2.2 Implementation of Kaizen activity at BLDCL

After identifying the operational and technical issues during the survey, improvement plans were proposed for materials, methods, equipment, etc., and specific Kaizen activities implemented and monitored as pilot projects. Based on the needs of the Bhutan government on February 2024, the pilot site for the Kaizen activity was the LPVAD, which functions as a gateway to the market for meat produced at BLDCL farms, where it is processed and adjusted. The process of introducing Kaizen activities is as follows:

Table 1-1 Procedures to introduce Kaizen methods to BLDCL

a. **Introduction stage** ・ Analyze the production process, cost structure, and value chain from procurement to shipping to understand on-site issues (inspection of farm sites and interviews with managers). ・ Hold workshops with on-site managers and staff to identify particularly critical issues. ・ Build consensus on the introduction of basic Kaizen methods. ・ Develop an action plan for Kaizen activities for half a year (determine a BLDCL task force team). b. **Implementation stage** ・ Check the progress online every month. ・ Review the action plan through a workshop about 3 to 4 months after the start of the activity. c. **Establishment stage** ・ Presenting the results of half-year activities in quantitative indicators and explaining the relationship with financial issues to the management team. ・ Elevating the results to cross-departmental initiatives. ・ After sharing information on the results, Kaizen activities become established.

Source: JICA Survey Team

The Bhutanese government is considering spreading the results of BLDCL's Kaizen activities to other SOEs. In addition to BLDCL, this survey conducts financial analysis on four companies: Farm Machinery Corporation Limited (FMCL),: Food Corporation of Bhutan Limited (FCBL) and Green Bhutan Corporation Limited (GBCL). The financial analysis will be conducted based on materials provided by the Bhutanese side and only recommendations will be made.

1.3 Plan of Operation of the Survey

The survey was conducted from November 2023 to February 2025 in three stages as follows:

[First Phase] November 2023 to January 2024

- Confirmation and review of the Bhutanese government development plans and related policies
- Financial analysis of SOEs
- Review of BLDCL's financial and activity analysis and formulation of a Kaizen implementation plan
- Study of case studies of SOEs reforms in other countries (Malaysia, Singapore, etc.)

[Second Phase] February to December 2024

- Formulate management improvement plans for BLDCL + 3 companies
- Kaizen introduction and continuous activities

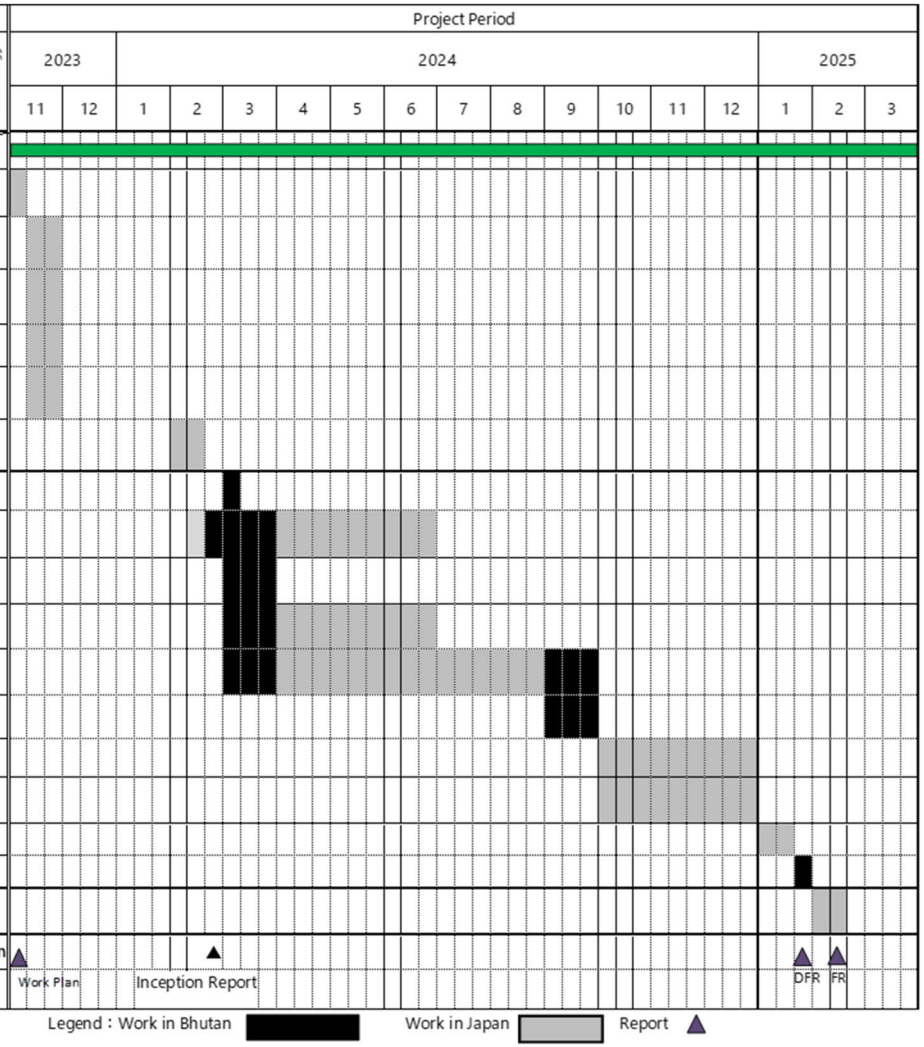
- Hold a workshop on introduction and knowledge sharing of Kaizen and BSC on March 15th, 2024, Kaizen seminar on March 20th and 21st, a workshop for disseminating Kaizen in BLDCL on September 19th, and SOE business strategy seminar on September 20th.
- Invitation to Japan (14 – 20 October 2024)
- Plan a JICA cooperation program

[Third Phase] December 2024 to January 2025 and [Fourth Phase] February 2025

- Preparation and explanation of the Draft Final Report from December 2024 to January 2025
- A workshop will be held on 29 January 2025 to wrap up the Kaizen activities
- Preparation and submission of the Final Report on February 2025

The plan of operation of this survey is shown into Figure 1-2.

Activities			Input (MM)	Consultant in charge: Project Manager/Business Strategy	Productivity Improvement/Kaizen Practice	Financial Analysis/Marketing	Livestock (swine) technology	Aquaculture technology
Project Period (Nov. 2023～Mar. 2025)								
First Stage：Nov. 2023	1-1)	Preparation and submission of work plans	0.10	●				
	1-2)	Review of development plans and related policies	0.15	●				
	1-3)	Financial analysis of state-owned enterprises	0.20			●		
	1-4)	Analysis of BLDC's finances and activities	0.10			●		
	1-5)	Development of BLDC's Kaizen implementation plan	0.05		●			
	1-6)	Inception report preparation and submission	0.15	●	●	●		
Second Stage：Dec. 2023 ～ Dec. 2024	2-1)	Inception Report Discussion	0.10	●	●	●		
	2-2)	Formulate business improvement plans for the three companies	1.13	●		●		
	2-3)	Concretization of BLDC's Kaizen implementation plan	0.87	●	●			
	2-4)	Analysis of technical issues at BLDC and formulation of improvement plans	1.80	●	●		●	●
	2-5)	Kaizen introduction and implementation activities	1.73	●	●		●	●
	2-6)	Discussion of guidelines for application to other state-run companies	1.00	●		●		
	2-7)	Invitation to Japan or a third country	0.35		●			
	2-8)	Concretize JICA cooperation program plan	0.35	●				
Third Stage：Jan. 2025	3-1)	Draft Final Report Preparation	0.48	●	●	●	●	●
	3-2)	Draft Final Report Explanatory Meeting	0.33	●	●			
Fourth Stage：Feb. 2025	4-1)	Final report preparation	0.10	●	●	●	●	●
Report Submission								
Total Input (MM)			9.00					

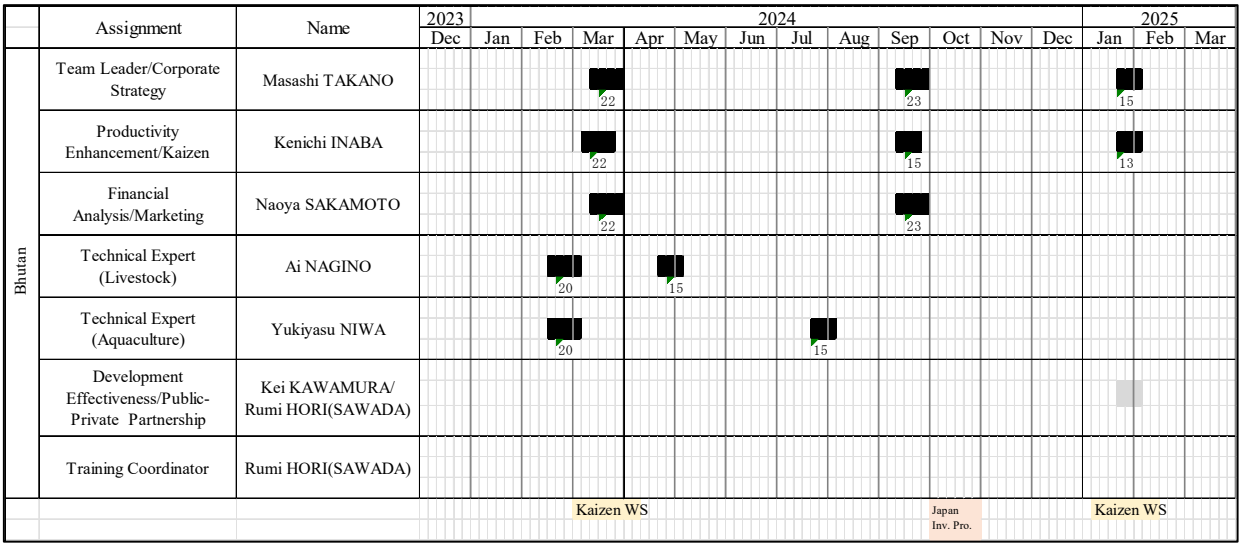


Source: JICA Survey Team

Figure 1-2 Plan of operation

1.4 Survey Team Members and Personnel Plan

The survey team members and personnel plan are shown in Figure 1-3.



Source: JICA Survey Team

Figure 1-3 Personnel Plan

CHAPTER 2. POLICY AND INSTITUTIONAL ENVIRONMENT SURROUNDING SOES

2.1 State policies surrounding SOEs

2.1.1 Vision and Mission

As noted in the foreword to the FY2021 Bhutan State Enterprises Annual Performance Review, SOEs play an important role in the economy of the Kingdom of Bhutan, particularly playing a strategic role in the provision of infrastructure and public services SOEs are important in the following sectors of the economy: banking, energy/power generation, real estate, They are important in key sectors of the economy, including banking, energy/power generation, real estate, postal services, transportation, manufacturing, telecommunications, lotteries, and aviation. In addition to revenue generation, SOEs are active in providing services in areas such as rural banking, electrification, farms, access to rural finance, and domestic air transportation.

SOEs are governed by the Public Finance Act of Bhutan (and its amendments, "PFA"). Under the PFA, the primary objective of an SOE is to operate as a successful enterprise; the SOE must strive to earn a return on capital in the medium-term equivalent to that earned by comparable enterprises in the private sector. The provision of non-profit goods and services is positioned as "maybe performed".

Meanwhile, the MOF, which exercises ownership of SOEs on behalf of the Royal Government of Bhutan (RGOB), recognizes that "the management of investments in SOEs is intended to ensure long-term value creation for the general public. The Ministry also believes that SOEs have an important role to play in reducing economic disparities and should take advantage of areas of economic opportunity where the private sector cannot participate. It also recognizes that adapting to changing conditions, embracing change, and thinking outside the box are the only strategies for SOEs to survive.

2.1.2 Structure

The MOF has primary responsibility for monitoring and reporting on the overall performance of the SOEs. The MOF recognizes that given the important role of SOEs in the Bhutanese economy and the impact of SOEs on national finances, it is critical that the government effectively monitor the performance of the SOE portfolio in a transparent and accountable manner.

On the other hand, the government agency with jurisdiction over the operations of each SOE is responsible for ensuring that government policies are followed by the SOE at all times and for providing technical expertise and assistance as needed. However, government agencies are prohibited from being involved in the management or day-to-day business decisions of the SOEs. The government agencies are also obligated to ensure that SOEs are in line with their establishment objectives and to recommend changes to them.

Government oversight of some SOEs is delegated to DHI, a holding company wholly owned by the Treasury Department. DHI operates as the commercial investment arm of the government and since its establishment in 2007, ownership of more than 15 SOEs has been transferred to DHI. SEs under

DHI fall into three categories: (i) wholly owned (100% owned by DHI), (ii) controlled (>50% equity ownership), and (iii) partnerships (20 - 50%), which fall into three categories. In addition, DHI's primary mission is to enhance the corporate governance of its portfolio companies to improve performance, raise investment capital, and maximize returns on investment by ensuring clear responsibility and accountability for performance. DHI also plays a catalytic role in promoting domestic private sector development and digital transformation and assists assists governments in developing key infrastructure and institutional reforms that are critical to stimulating economic and social welfare activities and promoting a diversified economy.

DHI's primary objective is to ensure that its companies are able to meet the challenges and requirements of the corporate sector in a competitive global economy DHI is charged with managing its portfolio as a prudent investor and asset owner with commercial discretion and flexibility to maximize value and returns to its shareholders DHI has appointed a high-value, experienced, and diverse Board of Directors (BODs) to promote best corporate governance practices within the group of companies and to assist and guide management. In addition, a Performance Management Committee and a Nominating and Governance Committee have been established to assist the Board in effective decision-making.

On the other hand, it is the BODs of each SOE that is ultimately responsible for the management and performance of the SOE, and the composition and function of the board has a significant impact on the SOE's operational and financial performance. The Treasury Department (and DHI) have adopted a selection process to ensure that the SOE's BODs is of an appropriate size and composition and should be composed of competent individuals. The MOF and DHI strive to ensure ongoing training of directors and that board meetings are held on a regular basis.

The BODs of the SOE shall appoint a Chief Executive Officer (CEO) in accordance with the Companies Act of the Kingdom of Bhutan the CEO shall be responsible for the management of the SOE. In particular, he/she shall ensure that the state-owned company owns and maintains

(1) Effective, efficient and transparent financial and risk management and internal control systems
(2) An internal audit system under the control and direction of the Audit Committee
(3) An appropriate procurement system that is competitive, transparent, and cost-effective
(4) A system to properly evaluate all major capital projects prior to final determination
(5) Costing systems for pricing and marketing

The Chairperson of each SOE's BODs, on behalf of the Board, evaluates the performance of the CEO within six months of the end of each fiscal year and reports to the Minister of Finance in the form and manner prescribed by the MOF. The MOF also compiles these reports and publishes the Bhutan State-Owned Enterprises Annual Performance Evaluation Report.

2.2 Related legal systems

Like private companies, Bhutanese SOEs are established as joint stock companies under the Companies Act and are subject to the Corporate Tax Act. However, their relationship with the government, which is their shareholder, is governed by the Finance Act. The basis of the corporate governance system for SOEs is also stipulated in the Finance Act, but details are provided in the Corporate Governance Guidelines for SOEs.

Table 2-1 Major laws and regulations for SEOs

Criteria	Title of Laws and Regulations	Shortened Name
Structure	Public Finance Act 2007	PFA
	Corporate Governance Guidelines for State Enterprises 2019	CGG for SE
Corporate	Companies Act of the Kingdom of Bhutan 2016	Company Act
Taxation	Income Tax Act of Bhutan 2001, 2012, 2014, 2020 Rules on the Income Tax Act of the Kingdom of Bhutan	ITA
	Fiscal Incentives Act of Bhutan 2021 Rules on the Fiscal Incentives Act 2021	FIA

Source: JICA Survey Team

This section first outlines the SOE-related provisions of the PFA, and then outlines the relevant provisions of corporate law, governance, and tax law.

2.2.1 Governance

The PFA is the law governing the finances of the RGOB. The PFA preamble states its purpose as follows;

"An Act to regulate the financial management of the RGOB in order to promote the effective and efficient use of public resources, strengthen accountability and provide statutory authority and control for sound and sustainable fiscal policy."

The PFA defines the government budget and the role of the MOF, and Chapter V of the PFA set the rules on SOEs. It covers the establishment of SOEs, their purposes, ministerial responsibilities, BODs, CEO, reporting, borrowing, and the treatment of cases in which the government is a minority shareholder. The responsibilities of the minister, BODs, and CEO were discussed in the previous section, so here JICA survey team will review the establishment, purpose, borrowing, and reporting of SOEs.:

First, under Article 74, the government is allowed to establish an SOE only if either

(1) If not provided by the private sector
(2) When the government is required to do so in whole or in part for social policy reasons
(3) When it is a natural monopoly

In the case of a natural monopoly of (3) of the above, the government regulates prices according to Article 78. In addition, Article 79 states that SOEs may be liquidated or privatized if a business operator offering similar goods or services comes to exist in the private sector.

In addition, pursuant to Article 75, when ministries and agencies are engaged in the manufacture and sale of goods or services in a commercial environment, they must choose whether to transfer their activities to an existing SOE or establish a new SOE if the number of employees and the market are sufficiently large. This execution is carried out by the Minister of Finance in consultation with the minister of the relevant sector, according to Article 76.

On the other hand, the established SOE must have the primary objective of operating as a "successful business" in accordance with Article 80. The criterion for success is to obtain the medium-term return on capital that similar private enterprises are obtaining. To achieve this, in Article 77, SOEs are allowed to diversify their business and grow to an appropriate size. However, under Article 97, SOEs may not borrow or otherwise incur debt without the written permission of the Minister of Finance.

On the other hand, Article 81 states that SOEs may also be given a social mission, such as to produce and sell products or services that are not necessarily profitable. In practice, such a social mission would be defined in the SOE's articles of incorporation.

SOEs are also required to report annually in accordance with the provisions of the Companies Act (Article 93). The Minister of Finance must report the annual report from SOEs to the National Assembly, which must include, among other things, the following items

(1) Significant losses, fraudulent, unusual or wasteful expenditures during the year
(2) Any disciplinary action taken as a result of the loss described in (1) above
(3) Material losses recovered or recovered
(4) Other matters as determined by the MOF.

In addition, the accounts of SOEs are subject to inspection by the Kingdom Audit Office in accordance with the provisions of the Audit Law (Article 96).

To strengthen and promote corporate governance and ensure consistent application of corporate governance standards across SOEs, the MOF has issued the Corporate Governance Guidelines for SOEs (CG Guidelines) 2019. The CG Guidelines 2019 were developed by the MOF in close consultation with relevant agencies and reviewed by a technical committee composed of representatives from the Registrar of Companies, DHI, and SOEs. They were also reviewed by experts from the World Bank and International Finance Cooperation (IFC).

The guidelines include more detailed provisions on the responsibilities and authority of the BODs and CEO, reporting from SOEs to MOF, etc.

2.2.2 Company Act

The Public Finance Act 2007 applies mutatis mutandis to the Companies Act 2000 (the "Companies Act") in its BODs and financial reporting provisions, but the Act has been repealed by the Companies Act 2016. Under Article 14 of the Companies Act, all legal entities formed prior to the enactment of the Companies Act are to be registered under the Companies Act, retaining their existing articles of incorporation.

Note that all companies established under Company Law are joint stock companies with limited liability. In addition, the Companies Act provides for public and private companies, but all SOEs must be established as public companies (Article 13).

Table 2-2 Companies Act Table of Contents

PREAMBLE Chapter 1: Preliminary Chapter 2: Types of company Chapter 3: Articles of Incorporation Chapter 4: Incorporation Chapter 5: Company names Chapter 6: Shares and securities Chapter 7: Directors Chapter 8: General meetings Chapter 9: Management and administration Chapter 10: Financial Statements and Audit	Chapter 11: Registration of charges Chapter 12: Compromises and amalgamations Chapter 13: Winding up, striking off and dissolution Chapter 14: The Regulatory Authority Chapter 15: Prosecution and penalties Chapter 16: Powers and Functions of Regulatory Authority Chapter 17: Definitions

Source: JICA Survey Team

From the above, this section outlines the public company-related provisions of Chapters 7 through 10 of the Companies Act.

According to Chapter 7, the SOE BODs must consist of at least three directors (Article 133), one-third of whom must be independent directors who receive a majority vote of confidence at the annual shareholders' meeting (Articles 134, 136). One-third of all directors must retire each year by rotation, and directors who remain in office must also be elected at the annual shareholders' meeting (Article 138).

In exercising his powers and performing his duties under the provisions of this Act or the articles of incorporation, a director of a corporation shall act in good faith and in the best interests of the corporation, and shall exercise the degree of care, diligence and skill which a reasonably prudent person would exercise under similar circumstances (Article 161). The "best interests of the company" referred to here shall take into account, among other things, the following matters (Article 162).

(1) The possible long-term consequences of any decision
(2) The interests of the employees of the company
(3) The need to promote the company's business relationships with suppliers, customers, and others
(4) The impact of the Company's operations on the community and the environment
(5) Maintain a reputation for high standards of business conduct.
(6) Fairness among shareholders.

The BODs must meet at least quarterly and four times a year (Article 146), but may also meet remotely by electronic means of communication (Article 150). The BODs may exercise all the powers granted to the company (Article 152), except for those matters to be resolved by the general meeting of shareholders (Article 153). However, in the case of SOEs, the BODs may also vote on resolutions passed at the annual shareholders' meeting as provided for in Chapter 8 (Article 179).[2]: The BODs may also transfer its powers to the CEO and other officers by resolution (Article 155).

The term of office of the CEO is one term of up to five years, and he/she may be reappointed for up to two additional terms (Article 210). The CEO cannot concurrently serve as CEO of another company (Article 212). The Chairman of the BODs is also elected from among the directors other than the CEO (Article 190).

Chapter 10 of the Companies Act governs the accounting of companies. The fiscal year of all companies ends at the end of December (Article 241). After approval by the BODs, the financial statements must be certified by the CEO and at least one director (Article 246) and to be reported to the general shareholders' meeting, which is held by the end of June for unlisted companies (Article 178).

In addition, the financial statements reported to the general meeting of shareholders must be accompanied by a report from the auditor to the shareholders (audit report) (Article 264). In the case of SOEs, the Director of the Comptroller General is the ex officio auditor, but the auditor who conducts the audit is appointed by the Royal Audit Office (Article 255).[3]

[2] Therefore, the CEO, who would normally be elected by the general meeting of shareholders, can be elected by the board of directors in the case of SOEs, as was the case under the old law (the 2000 Companies Act).

[3] According to BLDCL, the actual audit is performed by an accounting firm with offices in India.

Annual financial statements and audit reports are to be submitted to the registration authority by the end of May for listed companies and by the end of July for unlisted companies (Article 268).

2.2.3 Tax Act

The main taxes to which SOEs are subject include corporate income tax, which is a direct tax, and goods and services tax (GST) and customs duties, which are indirect taxes.

The corporate income tax rate is 30% on taxable income. However, there is a tax benefit system that provides tax exemptions or preferential tax rates for a certain period of time for businesses in the following sectors:[4] .

Tax-exempt business (not to exceed 10 years)

(1) Agriculture and Renewable Natural Resources (RNR); and
(2) Business Infrastructure Development; and
(3) Cooperatives; and
(4) Creative Industry; and
(5) Education, applicable to educational institutions with International Accreditation;.
(6) Energy, excluding hydroelectric projects; and
(7) Tourism, applicable to hotels only

Preferential tax rates (not to exceed 5 years) 5% for new projects: 15% for existing projects.

(1) Cottage and Small Industries (CSI);
(2) Education, applicable to
    1) Technical & Vocational Education and Training (TVET) schools
    2) higher secondary schools and above with science, technology, engineering and mathematics (STEM) subjects; and
(3) Information and Communication Technology (ICT); and
(4) Waste Management and Recycling Industries.

Other provisions include deductibility of capital investment in high-priority sectors and exemption of indirect taxes. However, there is no disparity in the treatment of SOEs and other private enterprises.

2.3 Past Investment by the Bhutanese Government in Major SOEs and Future Expectations

Investment by the Bhutanese government in major SOEs has played an important role in the development of the country, particularly in the fields of energy, infrastructure and manufacturing. These SOEs play the center role of the strategy for achieving a gradual transition to a more self-reliant, economically stable and diversified economy. Past investment and future expectations are summarized as follows.

[4] FISCAL INCENTIVES ACT OF BHUTAN 2021

2.3.1 Past investments in SOEs

First, the following Table 2-3 summarizes the evolution of the Bhutanese government's investments in SOEs. The establishment of full-fledged SOEs began in the 1980s, when Bhutan began to be affected by globalization.

Bhutan's investment in SOEs in the past has been extremely important for the country's economic development, particularly in the hydropower and infrastructure sectors. In the future, the country aims to diversify its economic base, with a focus on sustainability, digital transformation and regional integration. Despite some challenges, such as the poor performance of some SOEs and the need for greater financial efficiency, there is optimism that the role of SOEs will continue to evolve as they adapt to a changing global and regional economic landscape.

Box Expansion of the hydropower sector:

The 1970s was a period when Bhutan focused on hydropower, and this became the cornerstone of the country's economic development. The government began investing in hydropower projects to make use of the country's abundant water resources. The first major project, the Chukha Hydropower Project (336MW), was completed in 1986, and laid the foundation for Bhutan's hydropower-led economy.

In the 1980s and 1990s, investment in the hydropower sector expanded further, and in 2000 the Krichu hydropower project (60 MW) was completed, with many more projects in the pipeline. Investment in hydropower in Bhutan has helped to meet domestic energy demand, facilitated the export of electricity to India, and has become a major source of foreign exchange earnings.

The Druk Green Power Corporation (DGPC), established in 2007, is responsible for generating power for domestic consumption and for export to neighboring India. In 2008, the Punatsangchhu I Hydropower Project (1,200 MW) was launched, and further hydropower projects are planned for the future development. The increase in revenue from exporting hydropower to India has been an important factor in maintaining a stable international balance of payments.

As a result of Bhutan's focus on developing hydropower, large-scale projects such as Chukha (336 MW), Kurjichu (60 MW), Bigha Basa (over 500 MW), Punatsangchu I and II (total 2,000 MW) have been realized.

In the 2010s, while hydropower remained a key component of the economy, Bhutan faced challenges such as long preparation periods, budget overruns, and environmental concerns for large-scale infrastructure projects. The completion of large-scale hydropower projects such as Punatsangchu I & II was delayed, and some projects faced financial and technical difficulties.

As the country moves towards economic diversification in the 2020s, hydropower remains a central pillar of Bhutan's economic strategy. The government is focusing on modernizing the management of hydropower assets and improving the efficiency of SOEs in this sector.

Table 2-3 Globalization of the Bhutanese Economy and the Establishment of SOEs

Era	Periodicity of time	Economic Features	Establishment of typical SoEs
Prior to 1970s	Traditional economy and limited intervention of politics	・Agricultural economy with little industrialization (subsistence farming and livestock, small-scale cottage industry) ・Limited role of government in the economy (governance, maintenance of traditional practices, food security) and underdeveloped private sector	・Royal Bhutan Police(RBP)(1965): Law Enforcement ・Bank of Bhutan(BoB)(1968)：Largest and oldest commercial bank in Bhutan
1970s	Modernization and first investment in SoE	・The period of economic planning associated with modernization, and Bhutan's first five-year plans (1971-1976 and 1976-1981) focused on development of key sectors, particularly energy, agriculture, and infrastructure.	・Royal Insurance Corporation Bhutan（RICB)(1975): Service provider on Life Insurance, General Insurance, Reinsurance, Credit and Securities products and services.
1980s-1990s	Expansion of SoEs and economic planning	・As part of a strategy to industrialize the country, investment in SoEs (particularly in the energy, manufacturing and financial sectors) was increased ・These sectors struggled to compete with imports and did not reach the scale or competitiveness of larger economies	・Bhutan National Bank (1980): Government contact point for loans for development projects and support for economic infrastructure ・Druk Air (1981): Development of air routes and promotion of tourism ・Royal Insurance Corporation of Bhutan (RICB: 1982) and Bhutan Development Bank (BDBL:1988): Provision of life insurance to Bhutanese citizens and companies, and loans for rural development and infrastructure projects ・Food Corporation of Bhutan, Ltd. (FCBL)(1992): Aiming to have a centralized procurement and distribution system for supply of essential food across the country.
2000s	Focus on economic liberalization, private sector development, and modernization	・Commenced a broader program of economic liberalization and modernization (with a focus on improving infrastructure, attracting foreign investment, and reducing poverty) ・Commenced opening up the economy → private companies are free to operate → SoEs still account for an important part of the economy. ・Joined the World Trade Organization (WTO) in 2008 and continued to attract foreign investment to further economic liberalization.	・Bhutan Telecom (2000): Connecting remote areas in the country ・Bhutan Ferro Alloys Limited (2000): Refining alloys using hydroelectric power ・Bhutan Power Corporation (BPC) (2002): Responsible for the transmission and distribution of generated electricity ・Druk Holding and Investments (DHI: 2007): Manufacturing: overseeing industrial development, including textile manufacturing, cement production, and other key industries ・Druk Green Power Corporation (DGPC) (2007): Integration of hydropower projects that had been developed separately ・Bhutan Insurance Limited (BIL) (2009): Provision of compensation to individuals and companies
2010s	Overcoming contemporary challenges and transitioning to sustainable growth	・Faced with the economic challenges of being a small, landlocked country, Bhutan was also forced to respond to global economic trends, environmental sustainability, and modernization. ・There was increased pressure to diversify the economy beyond hydropower (the government focused on areas such as tourism, information and communications technology (ICT), and renewable energy). ・In order to address the profitability and sustainability of SoEs, there was a demand for good governance and efficiency.	・Bhutan Agro Industries Ltd. (2010): Aiming to achieve food self-sufficiency and add value to agricultural products ・Bank of Bhutan Limited (BoBL) (2012 Reformation): Established in 1968, the Bank of Bhutan is expanding its digital services ・Bhutan Telecom Limited (BT) (restructured 2013): Responding to the growing demand for mobile phones and broadband ・Royal Insurance Corporation of Bhutan Life Ltd. (RICB Life) (2015): Separated from the Royal Insurance Corporation of Bhutan Ltd. (RICB) to specialize in life insurance ・Farm Machinery Corporation Limited (FMCL) (2016): Aiming to provide farm mechanization goods and services to the Bhutanese farming community ・Green Corporation of Bhutan、Ltd.(GCBL)(2017)：Contributing to the management of green resources, including tree planting work, as well as tourism promotion and the creation of clean energy through the construction of hydroelectric power plants. ・Bhutan Livestock Development Corporation Ltd. (BLDCL)(2017): Aiming to stabilize the price on livestock products and increase quality.
2020s	Economic recovery, innovation, public-private partnerships	・Facing new challenges related to the coronavirus infection, climate change, and regional geopolitical tensions. ・Increasing trend to promote public-private partnerships (PPP) (especially in renewable energy, tourism infrastructure, and IT development), and exploring opportunities for partial privatization of some SoEs.	・Druk Holding & Investments (DHI) (Expanded role in 2020s): Responding to diversification in areas such as green energy, IT, and infrastructure ・Bhutan Sustainable Development Corporation (BSDC) (2020): Promoting environmental conservation and green development in line with Gross National Happiness (GNH) ・Bhutan Ecological Society (BES) Enterprises (2021): Established under the Bhutan Ecological Society, and responsible for environmental conservation, ecological research, and the promotion of sustainable business

Source: JICA Survey Team

Historically, the Bhutanese government has invested heavily in SOEs in several key sectors, focusing mainly on hydropower, infrastructure and essential services. The summary of investment on key sectors are as follows.

Hydropower sector: As mentioned above, hydropower is the cornerstone of Bhutanese state investment. With its abundant water resources, the country is investing heavily in the development of hydropower projects. The main investee in the hydroelectric power sector, the DGPC was nationalized in 2007 and is the leading company in the generation of electricity for domestic consumption and export to India. Hydroelectric power contributes the most to Bhutan's GDP and is the main source of foreign currency earnings.[5]

Infrastructure sector: DHI (nationalized in 2007) oversees multiple subsidiaries that contribute to infrastructure development, including hydropower, telecommunications, construction, and financial services. It acts as the holding company for most of Bhutan's SOEs and helps finance national infrastructure projects. The Bhutan Development Bank Limited (BDBL, nationalized in 1988): provides essential financial services necessary for infrastructure development.

Manufacturing and Industrial Sector: The government has invested in industrial projects through companies such as Bhutan Board Products Limited (BBPL: nationalized in 1992) for wood and wood-based products, Bhutan Ferro-Alloys Limited (BFAL: nationalized in 2000) for metallurgy, ferroalloys and Bhutan Carbide and Chemicals Limited (BCCL: nationalized in 1984) for chemical products.: These SOEs are under the supervision of said DHI (nationalized in 2007) in charge of national industrialization, but these sectors have not seen the same success or expansion as hydropower.

Agriculture and Forestry sector: In the agriculture sector, the FCBL (nationalized in 1992) has been in charge of the import and export of agricultural products in line with the food strategy. The state-owned BLDCL (nationalized in 2017) and FMCL (nationalized in 2016), which are also the subject of this case, are also state-owned companies established for the purpose of food security, with the aim of stabilizing agricultural product prices and ensuring food safety. The GBCL (nationalized in 2017), which is also under the same MOF, mainly supports the forestry sector.

2.3.2 Challenges in Past Investment

The following issues have become apparent with regard to the SOEs that have been established to date.

Financial constraints: Many SOEs are facing financial challenges, and a lack of capital is limiting expansion and innovation. Although the Bhutanese economy is growing, it is difficult to achieve economies of scale due to the small size of the economy and population.

Over-reliance on hydropower: Bhutan is overly reliant on hydropower and is vulnerable to fluctuations in water flow and monsoon patterns, as well as facing challenges associated with its dependence on energy exports.

Poor performance of some SOEs: Such as the BLDCL which is the subject of this JICA Survey, some SOEs, particularly in the agriculture and manufacturing sectors, are struggling to become competitive in regional and global markets. Problems such as low productivity, inefficiency and a lack of modern management practices mean that some SOEs are not fulfilling their potential.

[5] As a result of the intensive efforts of the government to develop hydroelectric power, large-scale projects such as Chuka (336 MW), Kurichu (60 MW), Biggar Bahasa (over 500 MW), and Punatsangchu I and II (total 2,000 MW) have been realized.

2.3.3 Future expectations

The Bhutanese government's (particularly the MOF) thinking at the end of 2024 is that SOEs should increase their concentration on profit-making sectors, and that the social business sector (it usually handles low profit projects) should be the responsibility of government agencies. The future expectations for SOEs are that they should make the responsible businesses profitable, while being affected by changes in the economic situation such as economic diversification and changing of global market. The expectations for SOEs in response to major environmental changes are explained as follows

Economic diversification: Economic diversification: The Bhutanese government recognizes the need to diversify beyond hydropower in order to ensure long-term economic sustainability. As such, it is expected that investment will be expanded into areas such as tourism[6], ICT[7], agriculture, and renewable energy (including wind and solar power). In particular, SOEs in the fields of transportation, tourism, and technology are expected to play a more active role in this diversification.

Privatization and Public-Private Partnerships (PPP): As part of broader economic reforms, the Bhutanese government is considering privatization or PPP to improve the efficiency and profitability of SOEs. This could lead to greater private sector participation in industries that have traditionally been monopolized by the state. In sectors such as banking and telecommunications, this could lead to greater efficiency and attract more investment.

Sustainability and the Green Economy: Bhutan is committing to environmental sustainability and has set a goal of maintaining a carbon-negative balance. This could lead to an increase in investment in green energy and environmentally friendly businesses. SOEs will play a leading role in projects in this area, such as increasing the generation of renewable energy, improving energy efficiency, and promoting a circular economy.

Regional integration and trade: Bhutan is deepening its engagement with South Asian and Southeast Asian markets through organizations such as the South Asian Association for Regional Cooperation (SAARC) and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC). It is expected that SOEs will play an important role in trade and regional integration. For example, the regional networking by Bhutan Airlines (Druk Air) and the increase in power exports to India by DGPC are expected to contribute to greater economic integration.

Human capital and capacity building: The future strategies of state-owned enterprises include investment in human capital and improvements in governance, management and operational efficiency. Therefore, investment in education, leadership development programs and the fostering of entrepreneurship within SOEs will be necessary in the future.

Tourism, renewable resources, non-hydroelectric energy: While hydropower remains a major asset, the government is hoping to use SOEs to expand investment in tourism and renewable energy (such as solar and wind power).

[6] The Bhutanese government has expressed an interest in expanding its tourism infrastructure through investment in services provided by hotels, airlines and other SOEs.

[7] Companies such as DrukNet and Bhutan Telecom are expected to play an important role in digital transformation in the future.

2.4 Donor support for SOEs

2.4.1 Support to National Economic Framework

The agreements reached in consultation with the World Bank are described in the Bhutan Systematic Country Diagnostic (SCD) Report,[8] and form the basis of the country's economic framework, including the development of the environment surrounding SOEs. This report outlines the key development challenges and opportunities for Bhutan, providing a strategic framework to guide the country's economic policies and reforms.

With regard to specific proposals for reforming Bhutan's SOEs, the framework emphasizes the following points

1. **Improving governance and accountability**: The report proposes strengthening the governance structure of state-owned enterprises to ensure transparency, accountability and efficiency. This includes strengthening oversight mechanisms and introducing performance-based management.
2. **Commercialization and privatization**: The framework proposes the commercialization of some state-owned enterprises to improve their competitiveness and make them financially sustainable. In some cases, partial or full privatization is recommended to reduce the government's financial burden and improve service delivery.
3. **Strengthening financial management**: The report emphasizes the need for better financial management practices in state-owned enterprises, including improved budgeting, cost control and revenue generation. This will reduce reliance on government subsidies and improve the overall health of the financial situation.
4. **Improving operational efficiency**: The framework advocates operational reforms to improve efficiency and productivity. *This includes elements of Kaizen, such as adopting the latest* technology*, streamlining processes and investing in human resource development.*
5. Promoting **private sector participation**: The report recommends more active involvement of the private sector in areas that have traditionally been monopolized by state-owned enterprises. This includes PPP and the competitive participation of private companies in certain markets.

Source: JICA Survey Team

2.4.2 Support to SOEs

The following Table 2-4 summarizes the support for Bhutan's SOEs from various donors in the past. The number of cases of support for SOEs to date is not large. This is because the SOEs themselves change their business areas and systems according to socioeconomic trends, and donor organizations are unable to respond to these changes. Alternatively, it is likely that support is being directed towards the government agencies that oversee SOEs, due to the expectation of chronic financial difficulties. Regarding support for SOEs, BLDCL and FMCL are supported though the Economic Stimulus Package (ESP).

In Bhutan's 13th Five-Year National Plan (2024-2028) Economic Stimulus Package is a program with a scale of Nu 15 billion to revitalize the economy, and this is part of the financial support package of Nu 100 billion from India.

[8] https://openknowledge.worldbank.org/entities/publication/8224ab36-43c5-5404-818d-a34f1f5c885c/full

Table 2-4 Donor support for Bhutan's SOEs

Sl. No.	Name of donor (Year)	Recipient SOE	Contents of support
1	Government of India (GoI): **Economic Stimulus Plan** (2024-2028)	Bhutan Livestock Development Corporation Ltd (BLDC) and Farm Machiebery Corporation Ltd (FMCL)	With a total of 15 billion Nurtam, the ESP focuses on strengthening domestic production, reducing youth unemployment, improving foreign exchange reserves, increasing new businesses, and reviving the tourism sector. The program aims to strengthen domestic production, reduce youth unemployment, improve foreign exchange reserves, increase new businesses, and revive the tourism industry. The main areas of funding include home-based and small-scale industries, tourism development, agriculture, and youth employment. Ongoing initiatives include support for tourism marketing campaigns, agriculture, livestock, and the De-Suung Skills Program. In addition, several initiatives are underway, including support for a price guarantee program that supports six priority crops such as rice, corn, wheat, quinoa, soybeans, and peanuts, as well as three livestock products such as pork, poultry, and fish. One notable aspect of the ESP is the concessional credit facility introduced on August 7, 2024. This initiative provides unsecured loans at an interest rate of 4% to support new and expanding businesses in agriculture, livestock, small and medium-sized enterprises, and manufacturing. There is also a revitalization fund that provides interest subsidies to support businesses seeking to recover from the pandemic.
2.	Government of India (GoI) (2021-2026)	Druk Green Power Corporation (DGPC)	-Released an amount of Nu./Rs. 164 million as grant to DGPC towards its share in the Kholongchu Hydroelectric Power Project Joint Venture
3	Japan International Cooperation Agency (JICA) (2014)	Bhutan Broadcasting Service Corporation (BBSC)	-Grant Aid (Project for Improvement of Equipment of Bhutan Broadcasting Service Corporation) -Technical Cooperation (Capacity Development of Bhutan Broadcasting Service)
4.	Japan Special Fund (JSF) (2010-2013)	Bhutan Power Corporation (BPC)	-Develop and execute an investment program to help the government achieve its goal of providing electricity to all by 2013. -Develop a sustainable business model for operating and maintaining off-and on-grid rural electrification services -Develop a wind power pilot project and biogas pilot project
5	Asian Development Bank (ADB) (1995-2006)	Bhutan Power Corporation (BPC)	-Advisory technical assistance (TA) for Capacity Building
6.	Danish International Development Agency (DANIDA), Asia-Pacific Broadcasting Union (ABU), Korean Broadcasting System (KBS) (1999)	Bhutan Broadcasting Service Corporation (BBSC)	- Financial and technical support for the master plan (Introducing Television)

Source:

ADB. (2005). *Capacity building for the bhutan power corporation* (Text 37398–012;Capacity Development Energy, p. 15). https://www.adb.org/projects/

ADB. (2011). *Bhutan: Preparing the Rural Renewable Energy Development Project* (Technical Assistance Consultant's Report 42252; TACR, p. 376). PA Consulting Group https://www.adb.org/sites/default/files/project-documents//42252-012-bhu-tacr-01.pdf

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Embassy of India. (2011, January 11). *Khel Press release april*. Embassy of India, Thimphu,Bhutan.

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CHAPTER 3. ADAPTATION OF KAIZEN ACTIVITIES TO THE SOE AND LESSONS LEARNED

3.1 Application of Kaizen activities in this survey

3.1.1 How came to implement Kaizen activities in BLDCL

The survey team was asked to select BLDCL for Kaizen study. BLDCL has been in there management reform initiated by MOF.

The government of Bhutan planned to implement the reform in three stages: short, medium, and long term and introducing Kaizen methods in long term. BLDCL is expected to improve its productivity and quality.

BLDCL's operating expense has been higher than its revenues in last 5 years except 2020. The deficit is attributed by (1) the cost structure of inhouse farms, and (2) inappropriate sales or purchase price setting caused by immature marketing. Effect of Kaizen activities to its business were expected particularly high for (1).

3.1.2 Current status of the organization (BLDCL) to be implemented Kaizen

BLDCL started its operations in August 2017 with an investment of Nu.33.33 million from the government and assets such as facilities and equipment with a book value of Nu.411.93 million from the government department as an organization responsible for commercial activities of the then Department of Livestock Production of the Ministry of Agriculture. In addition, BLDCL has received annual financial support from the government since 2017 (a cumulative total of Nu.423.78 million over the six years from 2017 to 2022) to promote its business. The company has 110 employees (as of December 2024), including those at headquarters and other locations, and a processing plant is in the suburbs of Thimphu City.

The original organizational objectives of BLDCL have been repeatedly reviewed by the Government of Bhutan at multiple times since its inception, and as of December 2024, the objectives of the organization are as follows.

Marketing

- Establish and strengthen market outlet facilities for all livestock and Agri-processed products.
- Coordinate and harmonize product aggregation from the farmers and marketing of all livestock products for domestic and export markets.

Input and Production

- Produce and supply Broiler Day Old Chicks (DOC).
- Promote and support domestic feed production and marketing and import of feed and other raw materials required for feed production.
- Lead in production of lives.
- Tock products for domestic and export markets.

Post-rearing

- Lead and promote post-production and value addition of livestock products.
- Institute and strengthen warehousing and cold storage services.
- Engage in product development/diversification processes and consultancy services
- on livestock enterprises.

Support Services

- Engage and catalyze collaborations with livestock contract farmers' groups/farmers/ youths/other farmers associated with the company in the area of livestock enterprise development and livestock farm mechanization/automation and also in provisioning of technical supports.
- Engage in Schools, Hospitals and other Institutional Feeding Programs
- Undertake other activities as directed by the Government/Board.

Financial Sustainability (Additional mandate after review)

- BLDCL will maximize production at the same time minimizing the cost of products. By doing so BLDCL can regulate the price in the market. The price in the market is such that it is not at profit maximization but rather to stabilize the market price and make BLDCL financially sustainable.

BLDCL has recorded a loss every year since 2018, except for 2020. The costs of purchasing from contract farmers are equivalent to the costs of operating the company's own farms (feed and staff wages), and the processing and trading business, which processes and sells livestock and fresh fish from farmers, is on a par in scale with the business of processing and selling livestock and farmed fish from the company's own farms.

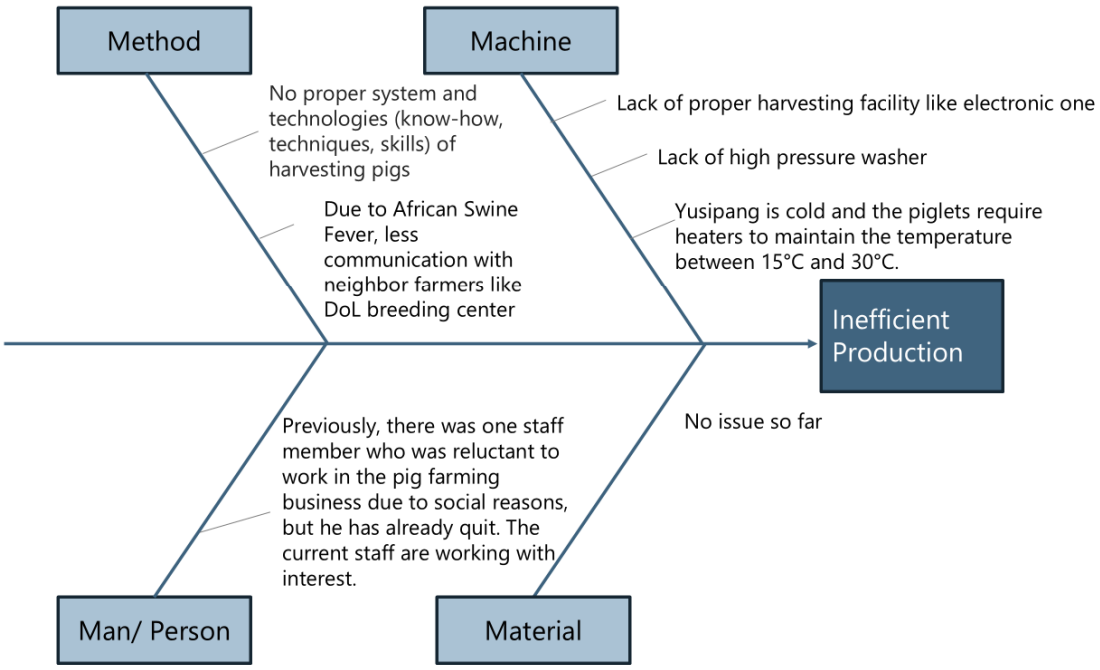
3.1.3 Unit-specific issues and directions for resolving issues through Kaizen activities

(1) Livestock Unit

1) Yusipang piggery farm

The following figure shows the challenges in the Yusipang piggery farm unit and the factors categorized within each item (Method, Machine, Man/Person and Material).

Fish bone diagram of Yusipang piggery farm. Most critical challenge is "Lack of an appropriate harvesting system based on animal welfare and food safety"



Source: JICA Survey Team

Figure 3-1 Challenges in Yusipang piggery farm and Their Factors

Although the farm manager and staff identified several factors of the challenge, as illustrated in the figure, the Yusipang piggery farm maintains a well-planned production cycle and ensures a consistent weekly supply of pigs. The farm adheres to the MOF review recommendations[9] and follows a structured pig production cycle, with a sow capacity of 100. Tentatively, the farm keeps 53 sows and 18 gilts. To achieve the target of 100 piglets per month (1,400 annually), the farm must reach and sustain a production level including 70 sows, which it aims to accomplish soon. Financially, the farm's performance is good.

The Yusipang piggery farm also strictly adheres to the Department of Livestock's (DOL) guidelines for enhancing farm biosecurity, especially for the prevention of African Swine Fever. These biosecurity measures should be maintained even after African Swine Fever is controlled in Bhutan, and the same level of biosecurity should be implemented at the Integrated Livestock Production Division (ILPD) in Samrang and the Relangthang layer farm soon.

To ensure knowledge transfer, the procedures practiced at Yusipang Piggery, such as castration and delivery assistance, should be thoroughly documented in written and video formats and shared with other farms in the BLDCL.

However, the lack of proper harvesting facilities, systems, and technologies for pigs remains the biggest challenge beyond the control of the Yusipang piggery farm. This issue is further detailed in section "3.2.2".

[9] Revival of Bhutan Livestock Development Corporation Ltd. Submitted by MOF and BLDCL

① Progress of Kaizen Activities

BLDCL has implemented the initiatives addressing the challenges in each category as outlined below.

Major findings from JICA survey team	Progress of improvement by BLDCL	Future Improvement Plan for 2025 by BLDCL
<A> Well-planned production cycle and weekly supply of pigs. Strict prevention measure of disease control. No big challenges need to be improved.	• Strict disposal/culling of under-performing breeding pigs (sow/gilt/boar). • Maintained enough replacement gilts and young boars for staggered piglet and pork production. • Adopt EM (Effective Microorganism) solution application in sheds and surroundings to promote Animal health, improved sanitation, odor reduction, and for fly and pest control.	• A pressure cleaning pump should be installed on the farm for work efficiency. • Increase sow level in the farm to meet the demand for piglets and pork. • Procurement of an electric stunner, dehairing and carcass splitting saw

② Lesson Learnt from Kaizen Activities

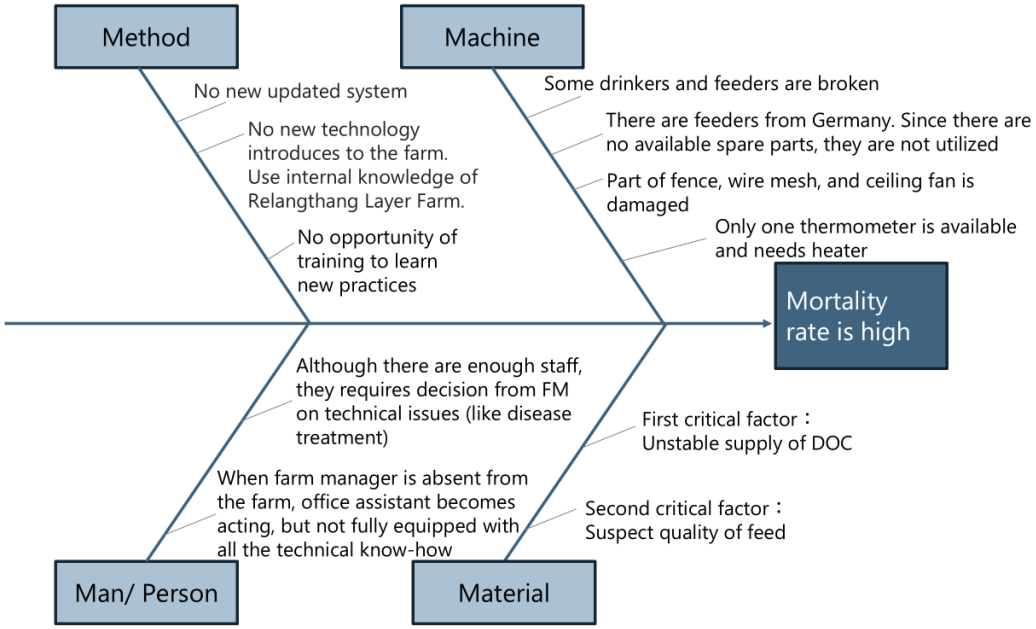
Marketing: The demand for pork is relatively stable, and at present, there are no major marketing challenges. Previously, LPVAD reported issues such as insufficient pork supply and poor-quality harvested pork. However, these concerns have been addressed following Kaizen activities, resulting in significant improvements.

Other Observations: A manager is proactively working to improve the pig farming business, making it one of the most promising and profitable ventures within BLDCL. It is expected that these successful practices could be applied to the ILPD in Samrang. To support this, the survey team has proposed the preparation of technical manuals and Standard Operating Procedures (SOPs).

2) Relangthang Layer Farm

The following figure shows the challenges in the Relangthang layer farm and the factors categorized within each item (Method, Machine, Man/Person and Material).

Fish bone diagram of Relangthang Layer Farm. Most critical challenge is related to input supply.



Source: JICA Survey Team

Figure 3-2 Challenges in Relangthang Layer Farm and Their Factors

Although the farm manager and staff identified several factors of the challenge, as illustrated in the figure, the Relangthang layer farm is technically well managed by a farm manager and staff.

The number of stocks at the farm significantly increased following a review by the MOF in July 2023, growing from 6,295 birds to 22,806 birds by February 2024. While the overall performance of the birds should be evaluated once the majority begin laying eggs, the farm is currently under the effective supervision of a skilled farm manager, with farm assistants closely following their direction. The farm's operations are technically well-managed, and its financial performance is reported to be good.

JICA survey team suggested the following countermeasures.

<Factor A: Needs sales plan of eggs and procurement plan of DOC for late 2024 and 2025>

The BLDCL is responsible for preparing a plan and sharing it with the Government Farm (National Poultry Development Center). Based on discussions with the "Sales & Dealership" and "Marketing & Research" teams, a market-oriented plan for selling eggs and procuring resources for the next year should be developed. Currently, the size of each layer batch (number of layers) and the production cycle are not standardized, which may lead to instability in the supply of eggs for customers.

<Factor B: Technically well managed by farm manager & staff. Needs technical manuals and SOPs>

The diagnosis of common diseases should be documented in written format or captured through video and shared among farm assistants to ensure knowledge dissemination. Additionally, specialized treatments such as debeaking, vaccination, and medication should be documented as

needed. Manuals and SOPs should be developed and distributed to Sarpang farm, new farms, and contract farmers in the future to promote consistent and effective disease management practices.

① Progress of Kaizen Activities

BLDCL has implemented the initiatives addressing the challenges in each category as outlined below.

Major findings from JICA survey team	Progress of improvement by BLDCL	Future Improvement Plan for 2025 by BLDCL
<A> Needs sales plan of eggs and procurement plan of DOC for late 2024 and 2025	• The unit was able to receive DOCs on time. In 2024 the farm received 15140 DOCs. Will receive 3600 DOCs on 18th of December 2024. • The unit has a plan to stock 25100 DOCs in the coming year (2025) and BLDCL have already submitted the demand for DOCs to the Government Farm (National Poultry Development Centre) in Sarpang	Eggs are transferred to the Sales and Dealership unit warehouse and transported in lots to Thimphu Market as usual
<B> Technically well managed by farm manager & staff. Needs technical manuals and SOP	• The unit has printed the manual for the farm assistant for easy reference and printed the simple SOP for the farm assistant for daily activities.	SOPs and the Farm Operation manual shall be used continuously
<C> Other issues if any		• Procure grass cutters to increase labour efficiency • Procure high-pressure cleaner for fast cleaning of sheds and ceiling level disinfecting, which will help maintain strict biosecurity of the farm.

② Lesson Learnt from Kaizen Activities

Marketing: The government supplies DOCs, but the supply is unstable, resulting in inconsistent egg production. Additionally, egg prices tend to decrease during the summer months. To address these challenges, it is necessary to secure stable buyers and develop a procurement plan for DOCs.

Other Recommendations: The manager possesses a high level of technical expertise, but in the manager's absence, other staff members sometimes struggle to make decisions. It is recommended to prepare technical manuals and SOPs to share the manager's knowledge both within and outside the farm.

3) ILPD in Samrang

Unlike the Yusipang piggery farm and the Relangthang layer farm, which showed improvement following the MOF's review, the ILPD in Samrang faces numerous operational challenges. The ILPD has not been financially viable for the past three years (2021 to 2023).

The most significant challenges facing the ILPD are:

- The operation of the hatchery and parent stock (PS) poultry houses, and
- The coal-contaminated water supply.

The issue of coal-contaminated water is discussed in detail in Section "3.2.2."

The hatchery and PS poultry houses have never been operated for business purposes. While they were briefly utilized on a trial basis to test functionality and assess initial feasibility, they have not been consistently or fully operational as part of a sustainable business model.

This challenge is rooted in past mismanagement decisions. Initially, BLDCL constructed three PS poultry houses attached to the hatchery, none of which were utilized. Despite this, BLDCL subsequently built two additional houses, which also remain unused. Instead of allocating resources to these facilities, BLDCL should have prioritized investments that directly benefited livestock production, such as feed procurement.

Additionally, BLDCL acquired a substantial amount of equipment that remains unused, highlighting inadequacies in the feasibility studies conducted at the time of procurement.

Beyond these key challenges, the table below presents major findings from the JICA survey team's visits to the ILPD between April and August 2024. It also outlines progress achieved by BLDCL using the Kaizen approach as of December 2024 and highlights BLDCL's plans for further improvements in 2025.

① Progress of Kaizen Activities

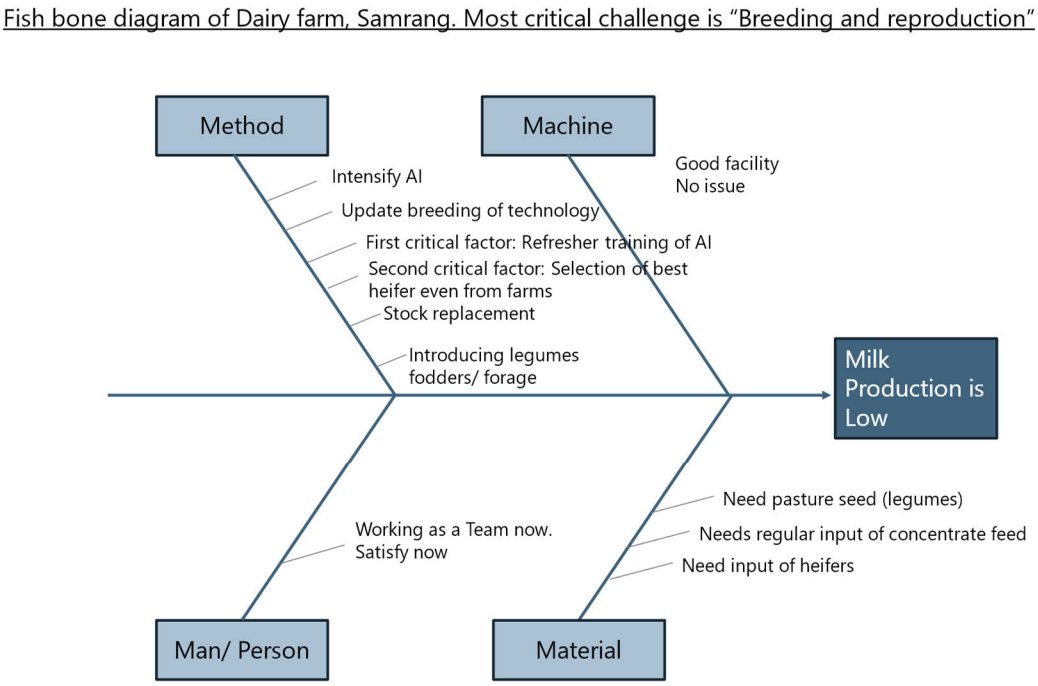
BLDCL has implemented the initiatives addressing the challenges in each category as outlined below.

	Major findings from JICA survey team	Progress of improvement by BLDCL	Future Improvement Plan for 2025 by BLDCL
Overall	<A> Negative profit from 2021 to 2023	• Conducted fortnightly/ Monthly business review meetings and reviewed expenditures to make the farms profitable by reducing unnecessary expenditure	• Scrutinize the business flow and animal stock management through user manuals and SOP_S
	<B> Separate management and administration of different farms within the integrated system	• Technically operated individually but the management is under one floor Manager	• Develop a strategic plan for each farm to enhance production and generate profit.
	<C> Inefficient utilization of investment	• Listed idle structures on the farm	• Three structures of two units each shall be transferred to Local Government, Samrang
	<D> Unnecessary items exist	• Unnecessary items disposed through open auction.	• Further identify the obsolete and unserviceable items to be auctioned
	<E> Contaminated water with coal	• BLDCL will identify clean water source by end of December 2024 and initiate construction of water line	• Hopefully, new and clean water will be made available to the farm animals and the community of Samrang:
	<F> Other issues if any	• Management of Shed Hygiene and Sanitation	• Propose labor saving mechanism such as high pressure pumps to maintain sanitation of the sheds

	Major findings from JICA survey team	Progress of improvement by BLDCL	Future Improvement Plan for 2025 by BLDCL
Layer Farm	<A> Need regular feed supply	• Consistent supply of feed initiated • No shortage of feed	• Annually identify reliable feed supplier for consistent supply of feed
	<B> Other issues if any		• Maintain shed hygiene and maintenance for strict biosecurity
Goat	<A> Has capacity to increase the number. Restock goats.	• The number of goats increased to 42 numbers with planned breeding	• Propose for breeding stock (Bucks and doelings for stock replacement)
Pig	<A> Following the practice of Yusipang Piggery and no big challenges are observed. Other issues if any.	• The extension of the existing piggery shed for 100 sow level is underway	• Procure electric stunner, dehairing (scalding) machine and carcass splitting saw
Dairy	<A> Replacement of cows should be always based on records (breeding, production, financial, etc.)	• Sold off 15 unproductive cows	• On farm breed improvement through insemination of sex-sorted semen will be continued for herd replacement as well as to sell heifers
	<B> Set up a proper recording system especially for individual cows. Needs individual records to assess the performance of animals and proper decisions of farm management	• Initiated proper recording system of individual cows	• Proper planning and management on breeding, reproduction and animal health to maximize the individual animal performance to derive optimum benefits.
	<C> Remove unproductive cows	• Sold off 15 unproductive cows	• Any unproductive animals on the farm shall be culled and sold
	<D> Needs to restock cattle to use the capacity of the facility		• On farm breed improvement through insemination of sex-sorted semen will be continued for herd replacement as well as to sell heifers
	<E> Update technology of breeding		• Will continue with Artificial Insemination
	<F> Send AI technician for refresher training course of AI practice	• Put up in the Human Resource Committee (HRC) for refresher courses for technicians in the relevant institution.	• Submit proposal for Training the AI Technician
	<G> Introducing legumes fodders/ forage		• Develop a few acres of subtropical legume pasture on the farm
Hatchery and Parents Stock house	<A> No operation of the facilities	• In the process of installing equipment to start rearing broiler PS and operation of hatchery.	• Staff to be trained in PS, hatchery and broiler management
	<B> Other issues if any	• Contacted with the Aviagen India to source broiler PS	• Import Broiler PS DOCs and rear for broiler DOC production

	Major findings from JICA survey team	Progress of improvement by BLDCL	Future Improvement Plan for 2025 by BLDCL
Agriculture machine center	<A> Elimination of waste. Since there are many idle machines, eliminate unutilized items/ equipment and do Kaizen activities.	• Machineries and equipment in the Centre are arranged. • Unwanted items disposed off	• Dispose of obsolete items • Repair and maintain machines an equipment required for the farm
Fish	<A> Water shortage	• Reliable clean water source to feed the pond to be explored.	• Explore Alternate water source
	<B> Water pollution	• JICA survey team will identify a clean water source by the end of December 2024 and initiate construction of a water line • Contacted BAUER Company based in Bhutan to filter the coal-laden water • The Company collected water samples and after a Laboratory test confirmed that constructed wetland (Low-cost wastewater management) cannot be a solution. • Mechanical filtration shall be too expensive for the company	
	<C> Lack of feed	• Introduced floating carp grower feed	• Continue feed sourcing on time
	<D> Destruction of necessary infrastructure for aquaculture	• The predator fencing destroyed by elephant are repaired and erected	• Install electric fencing at strategic location to protect elephant incursion
	<E> Necessary workers are not in place	• Human Resource (HR) requirement to be discussed – 1 farm assistant for 5 ponds	
	<F> Other issues if any	• Revamped fishery activities with the maintenance of 12 ponds. • Stocked 8700 stunted fingerlings and 13900 ordinary fingerlings	• Marketing of table fish when it attains 350 gms to reduce feed waste. • Renovate the remaining ponds for full production

The following figure shows the challenges in the Dairy unit in the ILPD and the factors categorized within each group (Method, Machine, Man/Person and Material).



Source: JICA Survey Team

Figure 3-3 Challenges in Dairy Unit of the ILPD in Samrang and Their Factors

② Lesson Learnt from Kaizen Activities

Operation of Hatchery and PS Poultry sheds: To address non-operation of the hatchery and the five PS sheds, government agency is considering intervention to support the hatchery and PS poultry sheds. The operation of the hatchery has been identified as a top priority by government agencies . BLDCL must also follow up on whether operating a broiler hatchery is viable as a state-owned enterprise.

Profitability of Livestock Unit: For pig farming and layer poultry farming, profitability appears feasible based on the performance of Yusipang piggery farm and Relangthang layer farm. However, attention should be given to the seasonal decline in egg prices during summer.

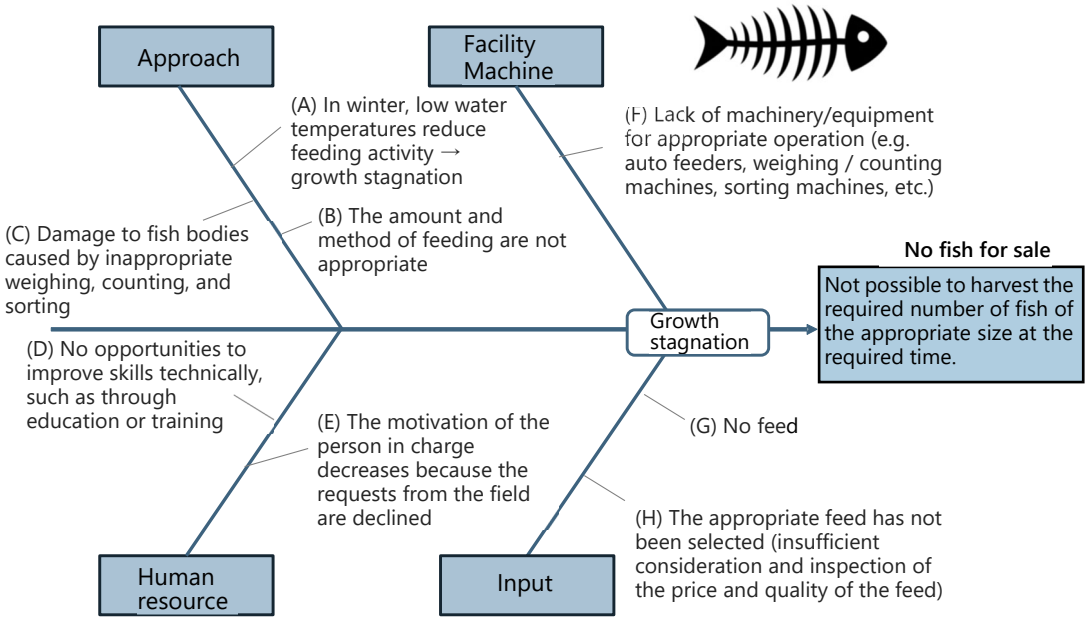
For the dairy sector, technical improvements are necessary, including actions to enhance reproduction and production performance, as well as the introduction of proper record-keeping systems. The goal is to achieve a production level of 8 liters per cow per day.

The dairy sector's capacity is 170 cattle, but currently, only 75 are being raised.

The farm also has 24 ha of pastureland with potential for goat farming development. There is market demand, such as selling six-month-old goats to neighboring farmers. However, with only 30 goats currently being raised, the introduction of breeding goats is essential.

(2) Trout aquaculture department

The issues in the trout aquaculture department and the factors in each category are organized as shown in the figure.



Source: JICA Survey Team

Figure 3-4 The issues and factors in trout aquaculture

The following countermeasures can be considered for each category of factors.

[Approach]

Countermeasure for <Issue A: In winter, low water temperatures reduce feeding activity, which causes growth stagnation>

In fish ponds, water temperatures drop to between 1 to 5℃ in winter (December to February). For example, when compared to rearing at a water temperature of 15℃, the feeding rate of rainbow trout fry (25-100g) is reduced to between half and one-third when the water temperature is below 5℃, and at 1℃ they almost stop feeding. As a countermeasure, it is thought that the feeding rate will increase and the growth stagnation will be improved by rearing the fry in the spring water pond of the DOL (National Research and Development Center for Riverine & Lake Fisheries : NRCR&LF) during the low water temperature period from December to February. In addition, it is also possible to shorten the rearing period until harvest by releasing large fry (e.g. 40g after intermediate rearing) at the start, and it is recommended to proceed in coordination with the DOL regarding fry size and the time of available.

Countermeasure for <Issue B: The amount and method of feeding are not appropriate>

The appropriate amount of feed is not being fed at the appropriate time to match the fish size and water temperature. This can be improved through training and guidance for workers.

Countermeasure for <Issue C: Damage to fish bodies caused by inappropriate weighing, counting, and sorting>

During the regular weighing, counting and size sorting, a certain number of fish die after being handled inappropriately each time. This could be improved by simplifying the handling, using anesthetics, and adding procedures such as a dip in a medicine bath (antimicrobial or antibiotic) after sorting.

[Human Resource]

Countermeasure for <Issue D: No opportunities to improve skills technically, such as through education or training>

The fish farm managers and workers called for education and training in aquaculture techniques. There were also calls for learning about sales methods, post-harvest processing and handling, and for involvement in marketing. It is thought that it would be effective to provide training to acquire appropriate and up-to-date aquaculture techniques and knowledge, and to create opportunities for receiving guidance from outside experts.

Countermeasure for <Issue E: The motivation of the person in charge decreases because the requests from the field are declined>

It has become difficult to maintain motivation as requests and wishes from the field (e.g. requests for procurement of necessary materials and equipment such as feed) continue to be ignored. It is possible to make some improvements by holding regular information exchange meetings between field technical staff and the management department.

[Facility · Machine]

Countermeasure for <Issue F: Lack of machinery/equipment for appropriate operation (e.g. auto feeders, weighing/counting machines, sorting machines, etc.)>

Using an automatic feeder during the fry stage, when feed frequency is high, can improve work efficiency and potentially shorten the fry period. Introducing an automatic feeder and taking countermeasures to save labor and reduce manpower can be effective.

In addition, there is a possibility that damage to the fish can be reduced by automatic weighing, counting, and size sorting. It is effective to introduce automatic sorting, weighing, and counting machines to promote labor and manpower savings. However, it is necessary to consider the production volume and sales profits that match the introduction cost.

[Input]

Countermeasure for <Issue G: No feed>

The fish farm requests the management department to procure the necessary amount, but due to a lack of budget, the order is not placed, and the fish cannot be fed the necessary feed at the necessary time. There is a need to closely coordinate with the budget management and procurement departments, but there are also limits to the efforts that can be made on the aquaculture side.

Countermeasure for <Issue H: The appropriate feed has not been selected>

There is insufficient consideration of feed prices and quality at present. In order to increase profits from aquaculture, it is necessary to lower production costs, i.e. to select 'medium to low-priced/high-quality feed' rather than 'high-priced/high-quality feed'. However, there is a lack of basic data for evaluating feed (such as comparative rearing). Therefore, it is necessary to conduct comparative rearing tests under the same conditions, evaluate feed after sorting and analyzing the basic data, then select the appropriate feed.

1) Kaizen activity progress

The following activities were promoted to address the issues in each category.

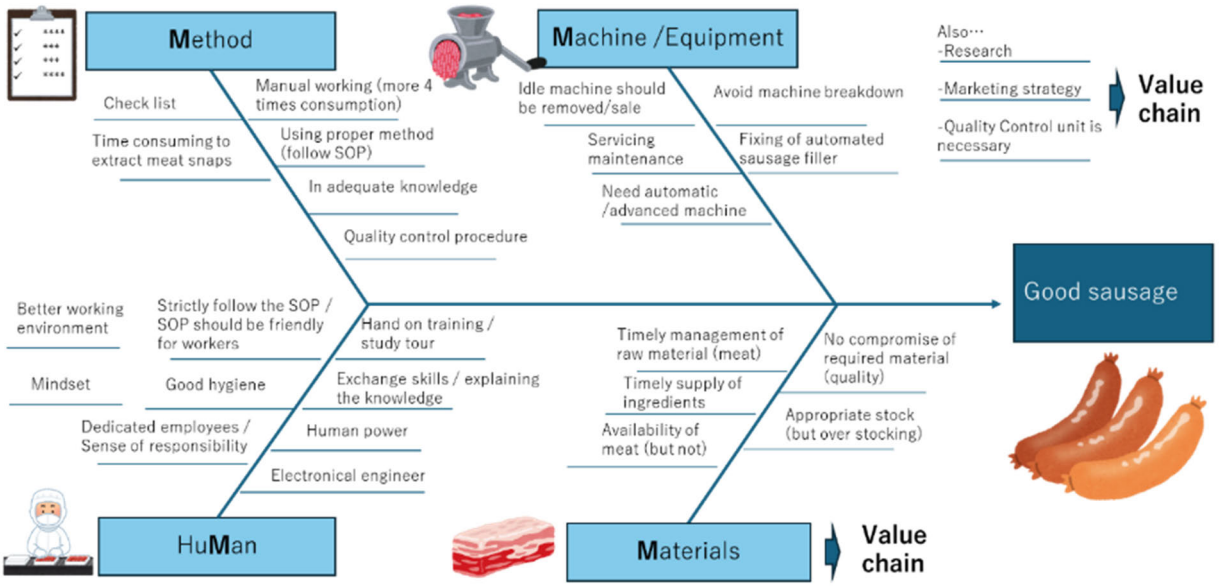
<**Issues A:** In winter, low water temperatures reduce feeding activity, which causes growth stagnation >	In coordination with the NRCR&LF of MOAL, the unit secured a spring water pond with a stable annual water temperature for winter fry rearing.
<**Issues B:** The amount and method of feeding are not appropriate>	The unit now procures feed and feeds the fish according to a feeding regime.
<**Issues C:** Damage to fish bodies caused by inappropriate weighing, counting, and sorting>	The fish farm staff gave instructions to handle the fish carefully and efficiently.
<**Issues D:** No opportunities to improve skills technically, such as through education or training >	The training in Japan has provided knowledge on Kaizen practices to develop a work efficiency and business-oriented mindset.
<**Issues E:** The motivation of the person in charge decreases because the requests from the field are declined>	The CEO has changed to fully support the requested plan.
<**Issues F:** Lack of machinery/equipment for appropriate operation>	A new fish gutting machine was installed.
<**Issues G:** No feed >	17 tons of feed for rainbow trout was procured and stored by feed size in the feed warehouse.
<**Issues H:** The appropriate feed has not been selected >	Worked with Dutch feed manufacturer Alltech Coppens and received advice as appropriate.

The required quantity of feed has been ordered. Feeding has resumed by borrowing feed stocks from DOL for the part that procurement could not be completed in time. The old stock fish (low-growth 2-year-old fish group that have been reared since 2021) that were occupying the rearing space will be harvested and sold within 2024, and new fry will be introduced at the start of the next production season (after February or March 2025, when winter ends). The plan is to introduce medium-sized fry (50g<) after intermediate rearing, in coordination with the DOL. By reviewing the production process, production is expected to increase in the second half of 2025, and it is expected that this will contribute to the business.

(3) Processing Department

Through interview to BLDCL, quality of processed products of meat is pointed out as one of the challenges of LPVAD. For visualizing the causes of the challenges, a mini workshop was held with the participation of CEO, production director, manage and LPVAD employees using the Fishbone Chart as a framework for discussion and analysis[10]. As a result, the following issues were identified.

[10] The Fishbone Chart is generally used as one of the 7QC Tools for analyzing the causes of quality issues. However, the chart was used as a framework for extracting general issues in LPVAD in this time, and discussions were held on the theme of "what is necessary to make good sausage" so that on-site employees could easily visualize the issues, and the discussions would move in a positive direction.



Source: JICA Survey Team

Figure 3-5 Challenges and factors in LPVAD's production of processed meat products

Through the above discussions in mini workshop and checking production sites, the challenges of LPVAD are summarized as below.

[Human Resource]

- Due to the social context, there are cases where employees have negative feelings about being involved in this work from their relatives and others, leading to a decrease in employee's motivation. Many employees are leaving[11] and especially the leaving of employees who have acquired skills also affected production. LPVAD managers are also feeling difficulties due to lack of equipment and current quality of work.
- Some employees were dissatisfied with the work environment. Especially working in a cold inventory, which temperature is approximately -20°C, is very hard condition for them.

[Method]

- Manuals, SOPs, and checklists required for production are lacking. When the work site is checked, SOPs are posted, but the contents are only machine operating instructions and are not actually referred to during operations. In addition, documents related to the operating procedures were stored in the office and not referred by employees.

[Machinery and equipment]

- There are some pieces of equipment that have been installed in the past but are not being used because they cannot perform the required processing, employees do not know how to operate them, or they are out of order. On the other hand, processes that require manual labor are time-consuming. In addition, unneeded equipment and machinery are placed at the work site and occupying space.

[11] According to the LPVAD manager, at the) time of the survey team's first visit (February 2024there were 23 employees working at LPVAD, but in the previous year, 2023, six had retired and two had been transferred.

- Lack of maintenance and engineers has affected the operation of the machines. For example, a smoking machine was not in operation at the time of the first visit due to a breakdown, but it was later repaired by the engineer newly hired, and the machine became operational.
- Production equipment is lacking for some processes, and it causes inefficient work. For example, during bacon production, the bacon is soaked overnight in brine because there is no brine injector. In addition, the production capacity of small slicers is not enough.

[Material]

- One of the issues related to pork quality is the method of harvest. Originally, harvesting required the animals to be stunned electrically, then the blood to be drained, and the internal organs to be processed quickly. However, although there are regional differences, there is a tendency not to openly harvest animals due to cultural background in Bhutan. Harvest houses are also difficult to build. For example, in Yusipang, a BLDCL pig farm, pigs are harvested in the backyard or near the exit and delivered to the LPVAD. This has affected the quality of the meat.
- There are cases where pigs purchased from farmers are not processed properly due to a lack of knowledge on the part of the farmers. For example, there was a case in which pigs were roasted using kerosene instead of being skinned by pouring hot water on them, and the smell of the roasted pigs remained.
- At the time of JICA survey team's visit in March 2024 and observation of cold inventory, pork was in short supply and there was no inventory, while chicken meat, which is in lower demand, was overstocked. In addition, meat was not separated by type in the freezers where it was stocked, and there was no batch control and first-in, first-out (FIFO) operations.
- Although there are baskets for meat in the LPVAD, the meat was stored directly on the floor.

During the mini workshop, the participants also confirmed that the appropriate treatment of meat cannot be solved only by LPVAD, which is a processing process, and it is necessary to work on Kaizen from upstreaming of the value chain. In addition, the participants also expressed the need to enhance research capabilities to understand market needs, the need for a marketing strategy for sales, and the need to clarify who is in charge of quality control.

Based on the above discussion, and in consultation with MOF and BLDCL, it was decided to set LPVAD as a pilot site in BLDCL to implement Kaien activities as trial under the support of Kaizen experts from JICA survey team.

3.2 Results and Lessons Learned in Applying Kaizen

3.2.1 Positive outcomes and lessons learned

(1) Results and lessons learned from Kaizen activities at LPVAD as a pilot site

1) Implementation of Kaizen Activities

Following a mini workshop[12] at LPVAD that identified issues with employee participation and a workshop participating the CEO and managers, as well as a seminar that introduced basic Kaizen methods, an objective and strategies were set as shown in Table 3-1 below.

Table 3-1 Objective and Strategies for Implementing Kaizen

Objective: Shift toward the market orientated business model
Strategy 1 : Eliminate inefficiency by applying basic Kaizen methods[13]
Strategy 2 : Improve quality through the value chain
Strategy 3 : Build organizational structure to meet with market needs

Source: JICA Survey Team

Of these, an action plan for approximately six months and its timeline were defined through discussions with LPVAD for Strategy 1. On the other hand, it was decided to confirm the direction at the beginning of the Kaizen activities and to consider specific actions depending on the progress for strategies 2 and 3. The reason for this was that although a lecture on basic Kaizen methods was given in the seminar, this was the first time that BLDCL was implementing Kaizen. Therefore, it was considered that after a certain level of Kaizen activities were implemented and the effects were felt, further activities would be more likely to proceed.

Kaizen activities were implemented from March to September 2024. For implementing Kaizen activities, Kaizen Initiative Members[14] were selected, consisting of five members: the CEO, production director, LPVAD manager, production personnel, and quality personnel[15], to promote Kaizen activities based on the action plan. Thereafter, monthly monitoring opportunities were set up in principle in online[16] to receive progress reports from the BLDCL side and to provide advice from the Kaizen experts in JICA survey team. The progress of the Kaizen activities is shown in Table 2-1 Progress of Kaizen Activities in BLDCL in Annex 2.1.

2) Results through Kaizen activities

The document in which the Kaizen expert summarized the results of each action is shown in Table 2-2 Kaizen Action Plans and Results in Appendix 2.2. Of each strategy, Strategy 1 initially described

[12] The mini workshop was held twice with the facilitation of the Kaizen expert and the participation of LPVAD employees to hear the voice of the frontline workers. The first time in March 2024, the issues were discussed using a fishborn framework for analysis, and the second time in September 2024, the participants discussed the impact of Kaizen and next challenges.

[13] Since the phrase "Inefficiency is the issue" was specifically emphasized during the initial interviews with MOF and BLDLCL at the beginning of the survey, care was taken to include it in order to create a sense of conviction about the issue setting.

[14] While keeping in mind the creation of an organization such as a "Kaizen committee," which is generally used to promote Kaizen activities on an ongoing basis, this time only one division of BLDCL was positioned as a trial, and since the number of visits and monitoring period were limited, a minimum number of members were selected.

[15] Quality Control Manager was hired in April 2024 and joined Kaizen Initiative Member.

[16] In principle, once a month, BLDCL provided progress reports using documents including photographs of the production sites prepared by BLDCL, and JICA survey team provided advice according to the progress of the reports.

actions that were relatively easy to achieve but future actions were added later because more progress was made. Action plans were also created for Strategies 2 and 3, which had not been defined up to actions at the start of the Kaizen activities.

In Strategy 1, "reduction of waste" and "number of suggestions from employees" were set as KPIs because they are important to demonstrate the effectiveness of Kaizen methods and participation of employees. The main results are shown in Table 3-2.

Table 3-2 Key Results in Strategy 1

Quantitative result	Qualitative result
• Created workspace: 3.139 m^2 • Reduced transportation time: 7 min→3 min. • Reduced working time in the freezing area: 30 min→10 min. • Reduced packing time: 40 → 10 min /100 packs • Reduction of production losses through standardization of work: Reduced 17% • Reduction of write off: chicken 0.9t→0t, pork 0.4t→0t • Reduction of losses due to change in packaging method: 4-5%→2%	• Improved work environment (from employee comments at mini workshop) • Realized smooth communication (from LPVAD manager's remarks) • Raised ideas from employees (11 ideas came up from employees)

Source: JICA Survey Team

As a major effect of waste reduction, a large number of unused equipment and materials in the workplace were initially identified using "Red Tag"[17], implemented as part of the first step of the 5S activity, and removed and sold or disposed of after discussion within the BLDCL. In the past, manual transport and inefficient work in the freezer area increased costs and burdened employees, but according to employees, the newly introduced trolleys, clear positioning with demarcation lines and labels have improved work efficiency and reduced workload. In addition, SOPs were introduced to clarify processing procedures such as cooking time, resulting in 17% reduction in meat processing losses.[18] In addition, from January to September in 2023, 0.9 tons of chicken and 0.4 tons of pork were discarded due to expired consumption caused mainly by long-term inventory[19], but the company was able to reduce the amount to zero by clarifying freezer compartments and implementing FIFO through lot management, and by promoting market distribution through cooperation with the marketing department. This reduction of wastes impacts significantly to BLDCL's business (equivalent to a loss reduction of approximately Nu. 328,000 based on the purchase price of meat).

On the other hand, according to the LPVAD manager, the ideas of Kaizen did not initially come from employees, despite setting an opinion box and other measures. The manager then gave a lecture on Kaizen to employees in the department and encouraged them to speak up during regular departmental meetings, resulting in 11 suggestions from employees. Moreover, at the end of the Kaizen guidance, a mini-workshop was held in LPVAD to discuss ideas for the next steps with the employees, and the several suggestions were made such as "A clear weekly work plan should be defined to improve operational efficiency and prevent cross contamination of meat" and "Improvement of lighting and

[17] This method involves sticking red tags on unused machines and materials, making a list of them, and then considering whether to move or dispose of them.

[18] This comparison is based on a sample survey.

[19] According to LPVAD, reasons for disposal include expiry of the expiration date due to long-term storage, as well as discarding parts that are not suitable for eating.

maintenance in the refrigeration equipment should be conducted timely" This is a more concrete discussion compared to the mini workshop when Kaizen was started.

For Strategy 2, it was discussed that a drastic solution to improve meat quality throughout the value chain would be to build a new harvest house to bleed and eviscerate the meat. However, according to BLDCL, it is difficult to secure a site due to the cultural background and environmental impact of harvest blood on surrounding facilities. In response to this situation, the LPVAD manager compiled the quality control items required by BLDCL as training materials and provided training to livestock farmers as an instructor based on the experience of conducting Kaizen activities such as SOP creation within the LPVAD. It can be said that this is a case where the Kaizen experience within LPVAD has been extended to solve problems in the value chain.

For Strategy 3, the company decided to create an organizational structure that can respond to market needs. As described in Strategy 1, the company facilitated communication between LPVAD and the marketing department to shorten the period between production and shipment, thereby reducing backlogged inventory that would otherwise cause disposal. In addition, LPVAD began operating monthly and weekly production plans, which had not been clearly defined in the past. In addition, the CEO recognized once again the need for communication based on the Kaizen activities in LPVAD and arranged a large table in the office of headquarters to allow the employees and visitors on business trips to communicate and work together.

The LPVAD manager and the quality control personnel took the lead in compiling these results, and for disseminating them to other departments of the BLDCL, the managers of other departments were invited to attend presentations and site visit of LPVAD. The presentation materials are attached in Appendix 2.3. Each manager developed an action plan based on the approaches considered effective at their respective sites, referring to the Kaizen activities at LPVAD. In addition, the Kaizen expert provided advice for the continuation of future Kaizen activities as shown in Table 2-3 in Appendix 2.4, Advice for Future Kaizen Implementation at BLDCL.

3) Lessons learned through Kaizen activities

Based on the experience of piloting Kaizen guidance from Kaizen expert to BLDCL, the following are lessons learned that can be applied to other SOEs and private companies.

■ Promote Kaizen activities based on CEO's commitment

Obtaining management commitment is an important factor in promoting Kaizen activities. In the case of BLDCL, the CEO had a strong awareness of the issues at the worksite from the beginning, so when the Kaizen activities started, the CEO gave instructions to the management level as well as allocating the budget for promoting the Kaizen activities communicating with the MOF.

On the other hand, it should be noted that Kaizen is not well recognized in Bhutan at this stage. Since it is assumed that it may be difficult for CEOs to understand and obtain commitment to Kaizen from the beginning, it should be considered to provide opportunities such as dissemination seminars for CEOs to understand the philosophy and methods of Kaizen, as incorporated in this survey.

- **Delegate authority and shift to bottom-up approach**

While CEO's commitment is essential in promoting Kaizen activities, CEOs cannot always devote time to Kaizen activities. Therefore, it is necessary to consider transferring authority so that managers and on-site employees can take the initiative in promoting Kaizen activities on a daily basis. In addition, since Kaizen will only be promoted if the problems are made visible to employees and if they are convinced of the activities to solve them, it is necessary to consider bottom-up activities that involve employees.

In the case of BLDCL, Kaizen was initially driven by the CEO with his strong initiative, but he gradually hands over and Kaizen initiative members took the lead in implementing and reporting on the action plan, achieving a smooth transfer of authority. In addition, at the start of the Kaizen activities, the following activities were implemented to ensure that manager and employees were aware of the Kaizen method: (1) mini workshop with employee participation at LPVAD to visualize the challenges, (2) Kaizen workshop attended by managers, (3) seminars for introducing Kaizen methods, and (4) Kaizen training instructed by the manager to employees within LPVAD.

However, in the future, when a company of a larger scale plans to implement Kaizen activities on a company-wide basis, it may be considered setting up the Kaizen Committee, organizing small-group activities for encouraging employee-led Kaizen proposals and introducing award system.

- **Quickly initiate and continue Kaizen activities based on the PDCA (Plan, Do, Check, Action) cycle**

When starting Kaizen activities, it is generally desirable to introduce the basic concepts and methods of Kaizen through dissemination seminars and to start Kaizen activities promptly after identifying issues to be addressed first through on-site diagnosis to attract the interest of companies. In addition, implementing Kaizen activities based on the PDCA cycle will lead to continuous improvement.

Based on the above idea, the Kaizen expert provided Kaizen seminar to BLDCL. Through the seminar, case studies such as SOP and clarification of fixed positions in other countries were shown, these contents attracted the interest of the CEO and managers. This led to the prompt implementation of LPVAD at workplaces. Also, objective and strategies of Kaizen were defined, but at the start of the Kaizen activities, the action plan was narrowed down to only Strategy 1, focusing on activities that were relatively easy to achieve. After the Kaizen activities were initiated, the effects of the Kaizen activities were checked and the actions were repeatedly reviewed through online monitoring, which was conducted once a month in principle. Through this process, LPVAD managers and frontline employees were able to confirm the effectiveness of the Kaizen activities and consider the next actions. This can be said as a small PDCA cycle for BLDCL that was quickly repeated multiple times, and this may be a factor that led to effective Kaizen activities in a short period of time.

- **Focus on benefits of all members of company / organization such as management, managers, and employees**

In providing Kaizen guidance, quantitative improvements have been collected and presented as results of Kaizen activities, such as increased work speed and reduced wastes, to gain the understanding of management and stakeholders. This is because even though Kaizen activities can

be started with a small investment, they require time, labor, and in some cases the purchase of necessary goods and equipment, and if the effects cannot be demonstrated quantitatively, especially for items that affect management as well as profit generation, it will be difficult to continue.

At the same time, in the case of LPVAD, employees' lower motivation was also cited as an issue due to the negative cultural image of meat processing, so for making it easier for employees to feel the effects of Kaizen, the employees were encouraged to promptly initiate activities that would lead to a reduction in workload, for example, reduction of work hours in the freezer room and manual movement of goods. At the end of the Kaizen instruction, LPVAD manager stated as below.

> "The employees are more mindful than before. In addition to the introduction of SOPs and the location signs, which make it easier to understand work procedures, communication among employees has clearly improved. The managers used to have to give detailed instructions and warnings to employees, but this is no longer the case."

This statement shows how the Kaizen activities have motivated employees and contributed to smoother day-to-day operations.

Since bottom-up approach by not only CEO but also managers and front-line employees are essential in promoting continuous Kaizen, it is necessary to focus on the benefits for both management and employees.

As a result of the Kaizen instruction and activities in this survey, it was confirmed that organizational capacity for bottom-up management improvement has been strengthened, and there is a possibility that this can be horizontally extended to other SOEs and the private sector. However, since Kaizen expert played a central role in setting objective, developing and carrying out action plans, and monitoring, it is necessary to train Kaizen trainers in Bhutan through the Training of Trainers (TOT) program for expanding the scope of horizontal deployment in the future.

(2) Management balance of both profitability and social responsibility by applying the BSC

As was confirmed in Chapter 2, SOEs must give first priority to operating as "successful businesses" in accordance with Article 80 of PFA. The benchmark for success is to achieve the same level of return on capital as private-sector companies in the same industry. On the other hand, Article 81 of PFA states that SOEs can be given a social mandate to produce and deliver products and services that do not necessarily make a profit. In fact, the four SOEs JICA survey team analyzed all have social missions stipulated in their articles of incorporation.

In this survey, JICA survey team initially had in mind the proposal to introduce the BSC, including the social contribution aspect of SOEs. The BSC approach pursues the following benefits;

(1) clarification of the organization's vision and strategy,
(2) comprehensive evaluation of performance,
(3) implementation and monitoring of strategy

To achieve these benefits, JICA survey team was planning to use four perspectives - "customer perspective", "financial perspective", "business process perspective" and "learning and growth perspective". However, in the actual survey, the introduction of the BSC was proposed for the future, and the concept was only explained at our seminars.

The first reason for this was that the MOF states that SOEs should focus on profitable businesses. It was recognized that BLDCL should focus on "financial perspective" as its immediate goal, so the sense of urgency and necessity for introducing the BSC was diminished.

The second reason is that BLDCL's various units produce different livestock products, so it is still a long way from being able to integrate its management. Even if JICA survey team proposes the introduction of BSC at this stage, it would be difficult to ensure that the evaluation indicators proposed by each unit were understood in common, and even if common evaluation indicators were created, they could create a sense of unfairness between units.

The third reason is that, even if the social contribution of BLDCL is included in the BSC, the relationship between BLDCL and consumers, or in other words, the analysis of marketing, is insufficient at this stage. For this reason, it was difficult to create the practical "evaluation indicators", "criteria (threshold values for evaluation indicators)" and "action plans" necessary for the formation of the BSC.

Based on the above, this survey only introduced the concept of BSC at seminars. As for the conflict between profit margin and social mission in SOEs, JICA survey team extracted scene of investment decision-making in SOEs, and indicated the direction of improvement in corporate governance from the legal framework point of view.

(3) Implementation of Kaizen Seminar and Survey on willingness to introduce Kaizen

Based on a request from MOF, an "Open Kaizen Seminar" was held on January 29, 2025 to provide an opportunity to disseminate Kaizen widely in Bhutan. The seminar consisted of lectures: (1) "Necessity of Kaizen in Bhutan" by MOF, (2) "Basic Kaizen Lecture" by a Kaizen expert from the JICA survey team, (3) "Introduction of Kaizen Activities and Results by BLDCL". The Minister of Finance, the Secretary of the Ministry of Industry, Commerce and Employment, and the Chief Representative of the JICA Bhutan Office attended as guests of honor, and a total of 54 people from ministries, SOEs, private companies, NGOs, JICA office and JICA survey team participated.

A questionnaire was distributed to 46 participants of the Kaizen Seminar, excluding guests of honor and JICA officials, for the purpose of conducting a survey on their willingness to introduce Kaizen, and was collected from 38 participants at the end of the seminar. The results of the survey are shown in Appendix 2.5.

Of the respondents, 92% indicated that Kaizen is a necessity in their organizations, 79% indicated that they would like to develop Kaizen specialists in their organizations, and 92% would like to learn more about Kaizen. It would indicate a strong desire to introduce Kaizen, develop human resources, and deepen their knowledge.

In the free responses, production efficiency, overproduction, document management, administrative tasks, inefficient use of resources, information sharing, and employee mindset were cited as issues that need to be resolved. In addition to responses such as implementing 5S activities, reviewing work processes, improving inventory management, and introducing electronic management as solutions, there were also references to facilitating communication within the organization.

As for bearing the actual costs associated with Kaizen implementation, 92% of the respondents answered that they would "bear the costs" or "it depends on the amount," leaving room for

consideration of bearing the costs associated with small investments, training, and consultation.

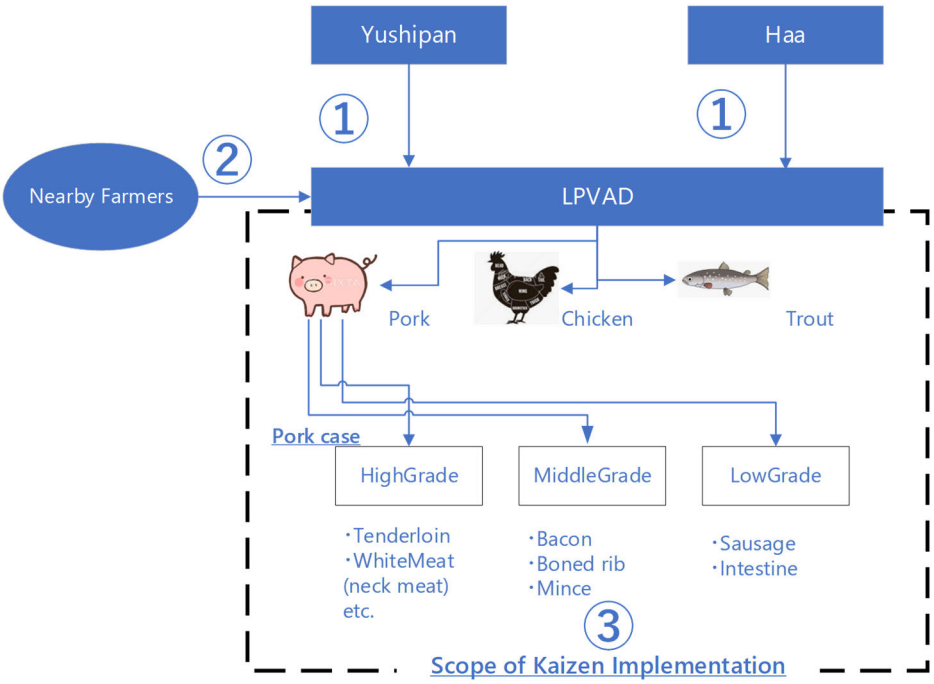
Furthermore, 55% of respondents agreed to create an organization to promote Kaizen in Bhutan, and 34% expect to train internal Kaizen specialists. Although there are differences between external and internal Kaizen personnel, it can be said that there is a need to develop human resources who can sustainably support the implementation of Kaizen in organizations.

3.2.2 Challenges in BLDCL that cannot be overcome through Kaizen activities

(1) Improving meat safety by overcoming challenges related to harvesting

There is urgent need for the country to introduce appropriate harvest systems based on food safety and animal welfare standards.

As the following figure shows, there are safety and quality concerns of livestock and fish products produced at LPVAD due to lack of proper harvesting system.



Source: JICA Survey Team

Figure 3-6 Safety and Quality Concerns of Food at LPVAD Due to Lack of Proper Harvesting System

① Safety and Quality Concerns at BLDCL farms

BLDCL has faced significant safety and quality concerns regarding its current practices. Pigs fattened in Yusipang are harvested, bled, and transported to LPVAD with their guts intact. Similarly, trout from Haa are delivered to LPVAD without gut removal[20].

These practices present serious drawbacks, including an increased risk of spoilage, the presence of residual blood, and a higher likelihood of pathogen transmission to consumers. Effectively addressing these challenges is essential for ensuring both product quality and consumer safety.

[20] As of December 2024, BLDCL installed a fish gutting machine, which is expected to resolve this issue.

② Sanitation Issues in Farmer-Supplied Meat

At the farm level, the following issues have been observed: 1) using kerosene to singe the surface of livestock to remove hair after harvest, 2) inadequate bleeding, and 3) transporting livestock without removing the internal organs after harvest.

BLDCL faces significant challenges in ensuring the sanitary inspection of meat purchased from such farmers, raising serious concerns about hygiene. Although LPVAD focuses on educating farmers, many lack adequate harvest system and infrastructure, such as sanitary harvest houses or hangers for carcass processing.

To address this, LPVAD has developed a checklist to evaluate carcasses from farmers. If a carcass does not meet LPVAD's standards, it will be rejected. However, from a scientific perspective, LPVAD still struggles to reliably assess the safety of meat due to the lack of analytical equipment for food testing.

③ Lack of Shared Safety Inspection Standards in Bhutan

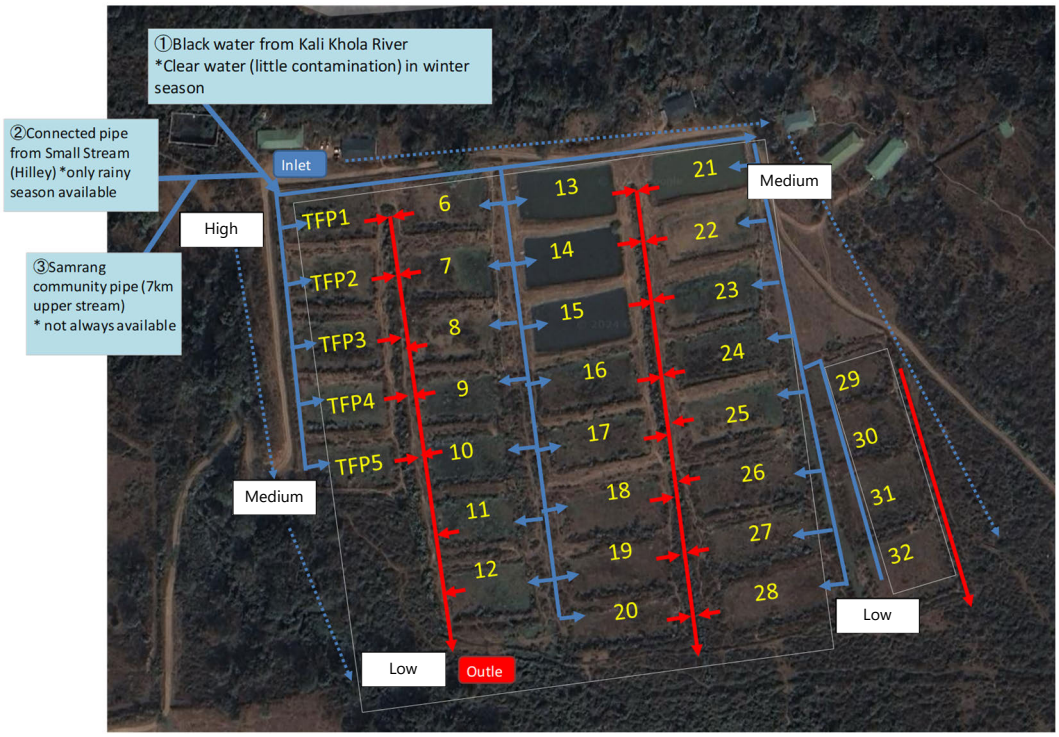
Safety inspections are conducted by the Bhutan Food and Drug Authority (BFDA) once a month through random sampling. However, the details of these sanitation checks are not shared with BLDCL. This lack of communication creates a gap in ensuring consistent safety standards. To address this, it is essential for BLDCL to confirm and collaborate with BFDA to gain clarity on inspection items and methodologies.

Another critical issue is ensuring the safety of meat purchased from farmers. For example, the BLDCL can conduct safety checks on harvested livestock or to limit purchasing the livestock from the farmers based on specific quality standards. These measures are essential for ensuring food safety and maintaining product quality.

Within BLDCL, the construction of a pig harvest facility is under consideration, but no concrete progress has been made in discussions with the government. The absence of an established harvest system hinders the full effectiveness of Kaizen initiatives. However, LPVAD has started feasible initiatives such as providing guidance to farmers on harvesting practices, including bleeding techniques and skinning procedures, demonstrating progress despite these challenges.

(2) Water source problem for fish ponds

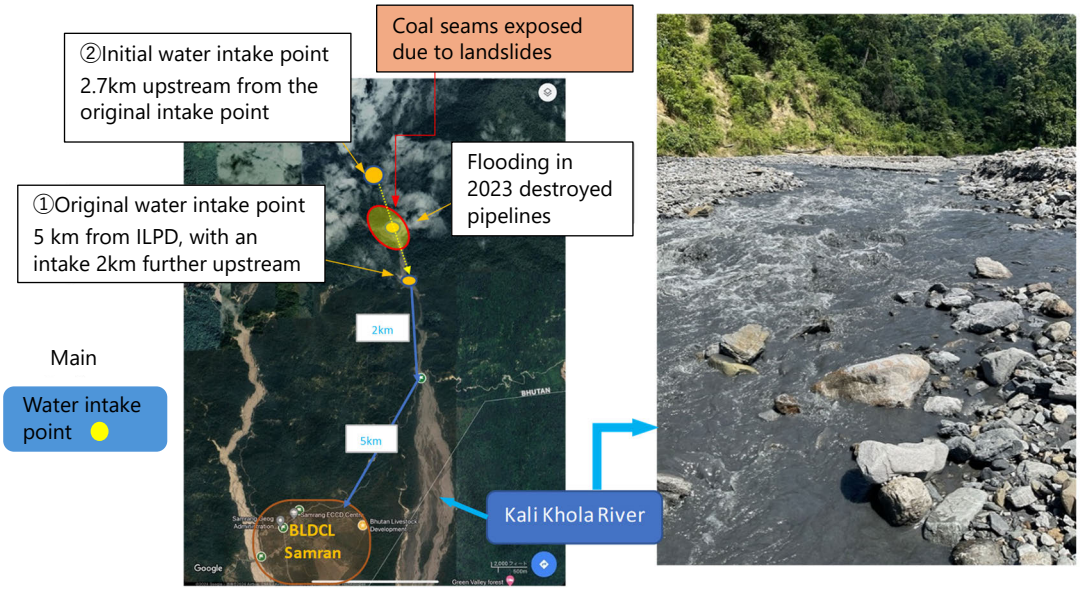
Of the 32 fish ponds at the Samrang farm, only 4 were actually filled with water and used as of 2024. The other ponds have not been supplied with water for a long time and have dried up, and are currently overgrown with grass and cannot be used for aquaculture.



Source: JICA Survey Team

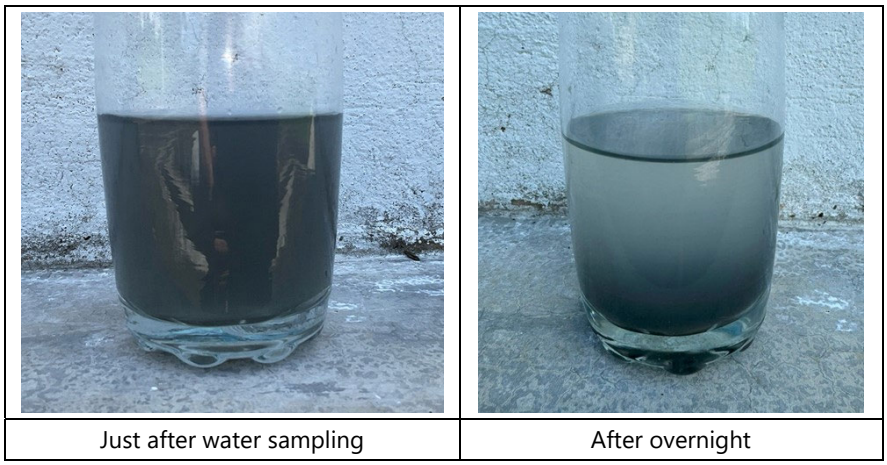
Figure 3-7 Overview of Samrang farm an water network

The main water source at the Samrang farm is ① river (Kali Khola River), but there are coal seams exposed in the upstream, and when there is a lot of rain or a landslide, black muddy water (black water that has dissolved from the coal seams) flows in. In order to deal with this, it was necessary to draw water from an area upstream of the coal bed, and a simple weir was constructed at a new intake point upstream (2.7km upstream from the original intake point), and a pipe was laid to draw water to the farm, but in 2023, the pipe was destroyed by a landslide. As a result, it is currently not possible to draw water from the upstream area which is not contaminated, and only the blackish-brown water contaminated by coal can be used. As the Samrang farm is surrounded by forest, the water from the spring that appears in the surrounding mountains during the summer (April to October), when there is a lot of rainfall, is drawn in using simple pipes and rubber hoses (② and ③ in the figure), but the amount of water is insufficient. This is the main reason why the 32 fish ponds cannot be used.



Source: JICA Survey Team

Figure 3-8 Water source plan



Just after water sampling	After overnight

Source: JICA Survey Team

Figure 3-9 Farm water taken from the Kali Khola River

BLDCL is considering a plan to avoid the coal exposure layer, install a new water intake upstream and pipe-conduct water. Although the problem may be temporarily solved, it is not considered to be an effective strategy to try again to conduct water from the same river due to the considerable costs and, given the topography and climatic characteristics of the source area, the high risk of pipe damage due to another flood or landslide event. The research and securing new water sources is considered essential for the continuation of aquaculture operations.

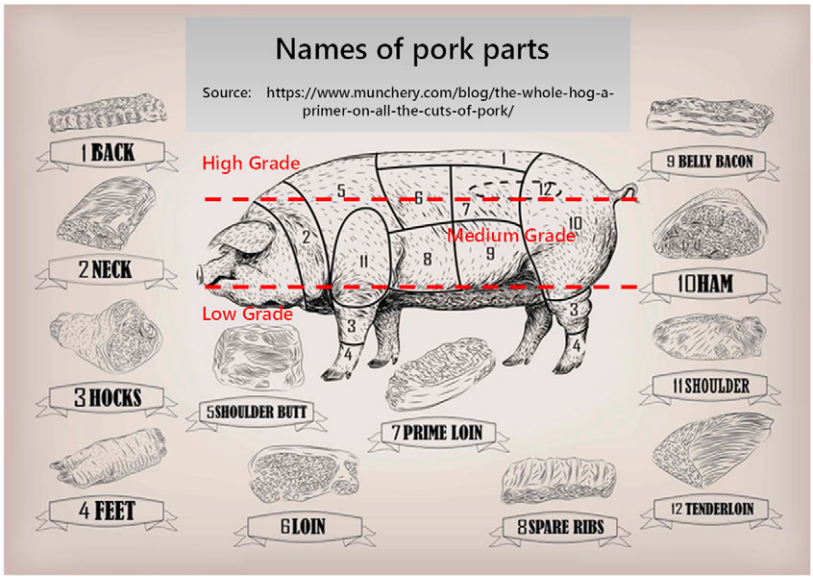
(3) Stagnation of value added due to undifferentiated meat grade

1) The current meat sales by the BLDCL

The LPVAD collects meat that has been harvested, cut up and given a preliminary treatment from Yushipan (pork), Sarpang (chicken) and Haa (trout), and processes and adjusts it to meet consumer demand before forwarding it to market. The LPVAD processes it for consumers and sells it to six retailers in Thimphu at a predetermined fixed price. This selling price is reviewed periodically with

the approval of the BLDCL BODs, but it is set at a fair price from the standpoint of consumer protection, and it is not set in a way that would allow the BLDCL to make a large profit.

The list of products sold by the BLDCL Marketing Unit includes 27 products made from these three livestock products, and for pork, for example, there are 9 different cuts and 6 processed products such as sausages, for a total of 15 products (see Figure 3-11). In the case of pork[21], the meat quality and price generally vary greatly depending on the part of the pig, and the rare parts such as the tenderloin and loin (shoulder butt) are high-end products. Generally, the parts that yield the most meat (such as spare ribs and belly bacon in Figure 3-10 below) are considered to be mid-grade pork, while the parts below the underlined parts, such as offal and pig's feet, are considered to be low-grade.



Source: https://www.munchery.com/blog/the-whole-hog-a-primer-on-all-the-cuts-of-pork/

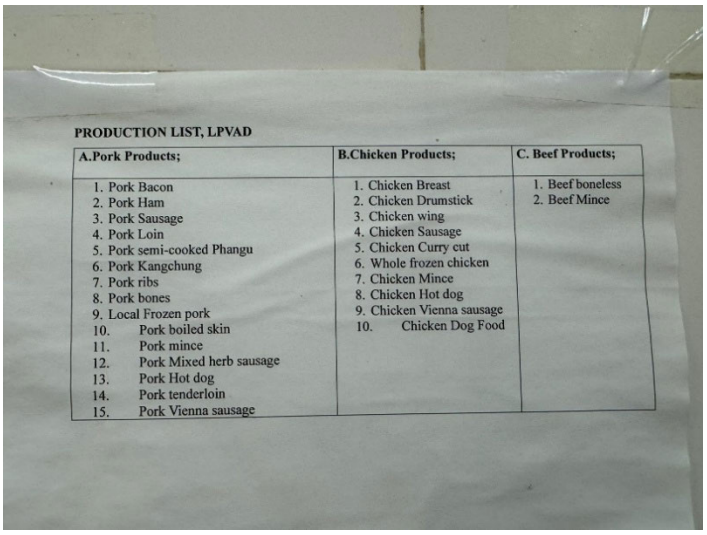
Figure 3-10 Grade of pork by parts

On the other hand, the sales to the six retailers mentioned above are based on orders from the retailers once a week, so to speak, 'order sales'. In other words, the retailers' orders can be said to reflect the consumers' preferences for meat. Unfortunately, however, even in Thimphu, the capital of Bhutan, consumers prefer 'pork kangchung' (meat with bone), and the concept of high-grade and low-grade parts is not widespread in pork marketing. In other words, all of the above-mentioned tenderloin and loin meat is made into 'pork kangchung' and sold.

2) Issues and strategies related to consumer preferences

The Kaizen activities in this survey have achieved positive results in terms of business efficiency for LPVAD. It is hoped that Kaizen activities will be successful in other units through BLDCL's own efforts in the future. However, even with these activities, the value added per pig forwarded from Yushipan will not increase. The Marketing Unit of BLDCL alone cannot stimulate consumer preferences. Even in restaurants in Thimphu that cater to tourists, there are very few that offer pork dishes prepared by part. As one of the few examples, JICA Survey Team will post the menu of "Coffee Culture". Incidentally, the high-end meat at this restaurant is imported mainly from Thailand (see Figure 3-12).

[21] The same structure basically applies to chicken and beef as well.



PRODUCTION LIST, LPVAD

A.Pork Products;	B.Chicken Products;	C. Beef Products;
1. Pork Bacon 2. Pork Ham 3. Pork Sausage 4. Pork Loin 5. Pork semi-cooked Phangu 6. Pork Kangchung 7. Pork ribs 8. Pork bones 9. Local Frozen pork 10. Pork boiled skin 11. Pork mince 12. Pork Mixed herb sausage 13. Pork Hot dog 14. Pork tenderloin 15. Pork Vienna sausage	1. Chicken Breast 2. Chicken Drumstick 3. Chicken wing 4. Chicken Sausage 5. Chicken Curry cut 6. Whole frozen chicken 7. Chicken Mince 8. Chicken Hot dog 9. Chicken Vienna sausage 10. Chicken Dog Food	1. Beef boneless 2. Beef Mince

Source: JICA Survey Team

Figure 3-11 List of Sellable Products by BLDCL

※Changlam Changlam Square, Thimphu

Source: JICA Survey Team

Figure 3-12 Customer's Menu of "Coffee Culture", Thimphu

As this survey strayed from its original purpose, it is not clear whether Bhutanese people originally prefer meat with bone (Kanchung-type) to high-grade meat, or the menus and eating habits using high-grade meat are undifferentiated. Even if it is the former, there is no doubt that gourmet food in Bhutan will become a tourist attraction especially for foreign tourists, and in that sense, if it is possible to sell high-quality cuts to foreigners and wealthy people at higher prices, the value added of the meat from each pig will increase. In other words, the following strategies can be envisaged.

i. High-end cuts: Develop distribution channels for the wealthy and tourists. In particular, strengthen marketing for high-end hotels and restaurants.

ii. Medium-end cuts: Maintain current sales of Kanchung-type cuts. Be aware that this is the volume zone as a whole for Bhutanese and focus on maintaining a stable supply rather than profit.

iii. Low-end cuts: Develop menus and marketing to sell low-end cuts from Japan, South Korea, and Thailand at the same price as high-end cuts.

3) Issues related to processed meat products

In particular, regarding sausages and bacon, it is necessary to sell products at a loss in order to compete with imports from India and Thailand. On the other hand, in terms of quality, there is no distinctive quality or flavor that is unique to Bhutanese products. If this situation continues, the share of foreign products, which are cheaper and more varied, will increase. It is likely that Bhutan will have to make a difficult choice on domestic production of processed meat products, as it will be competing with India and Thailand, which have a huge advantage in terms of quantity. For this reason, it will be necessary to develop products that make the most of the unique characteristics of Bhutanese ingredients and that cannot be imitated by foreign products. In other words, it will be necessary to develop products with a maximum of 3-4 varieties that have a unique flavor and are of high freshness, and to launch these as Bhutanese brands and popularize them among the people.

BLDCL will be responsible for implementing this activity. For this reason, it will be advisable to invite experts with practical experience to learn the necessary skills, etc.

CHAPTER 4. CONTRIBUTION STRATEGIES FOR SUPPORTING SOES BY JAPAN

4.1 Establishment of Kaizen Unit in Bhutan and development of Kaizen trainers

The needs and reasons for utilizing Kaizen in Bhutan are as follows.

Table 4-1 The needs for Kaizen activities in Bhutan

1. Sustainable development

Bhutan emphasizes Gross National Happiness (GNH) over pure economic growth, with a focus on sustainability, happiness, and environmental protection. Kaizen aligns with this philosophy by promoting continuous and incremental improvements that benefit not only the company, but also the local community and environment.

2. Economic diversification

Bhutan's economy is heavily dependent on hydropower and agriculture. To diversify and strengthen other sectors, Kaizen will help optimize processes, reduce waste, and increase productivity in industries such as manufacturing, tourism, and services to increase the competitiveness and sustainability of these sectors.

3. Skills development

Kaizen encourages the involvement of all levels of management and employees in problem solving and improvement efforts. This focus on collaboration will help Bhutan develop a more skilled workforce, which is essential to the country's long-term economic development.

4. Efficient governance

In the public sector, Kaizen improves the efficiency of government services, leading to improved public services. For countries focused on good governance, Kaizen can be a tool to eliminate inefficiencies, reduce bureaucracy, and improve citizen satisfaction.

5. Environmental conservation

Bhutan is committed to remaining carbon neutral. Kaizen's focus on waste reduction and process improvements will contribute to this effort through increased energy efficiency, reduced resource consumption, and encouragement of sustainable practices in industry.

6. Cultural fit

Kaizen promotes the idea of continuous self-improvement, which is consistent with Bhutanese Buddhist values of mindfulness and incremental improvement. This makes Kaizen culturally adaptable and in harmony with the Bhutanese spirit, which emphasizes a balance between both spiritual and material development.

7. Tourism and services

Kaizen will help improve the quality and efficiency of the tourism sector, a key economic driver in Bhutan. Improved service standards and operational efficiency will improve the quality of tourism and contribute to Bhutan's "high value, low impact" tourism strategy.

Source: JICA Survey Team

By adopting Kaizen practices, Bhutan can improve productivity, sustainability, and service quality across multiple sectors while remaining true to its own development philosophy focused on inclusive well-being.

4.1.1 Project Objectives and Development Scenario

This project is based on the specific proposal for reforming Bhutan's SOEs outlined in the World Bank's SCD Report, "2. Commercialization and privatization" (see 2.4.1).

The government of Bhutan seems to be considering Kaizen practice is not only as a way to improve the productivity of SOEs, but also as something that should be introduced as a prerequisite for privatizing successful SOEs. Furthermore, in the future, they hope to use it as a promising tool for strengthening the competitiveness of the private sector and improving the abilities of employees.

In response to this, the Investment & Corporate Governance Division of the MOF is planning to implement Kaizen consulting for SOEs by itself, and to eliminate loss and foster the Kaizen spirit in promising SOEs that are expected to be privatized. To this end, the division is expecting receiving support from Japan to train its staff as Kaizen trainers, and in the medium to long term, it hopes to promote this Kaizen team to an external organization of the MOF, forming a National Kaizen Unit (NKU) that will become the headquarters for Kaizen activities throughout the country. For this project, the Investment & Corporate Governance Division is planning to have Gedu College and Business Studies (GCBS) participate as a partner in joint Kaizen consulting.

This project aims to support the formation of the Kaizen Unit in the MOF of Bhutan and the development of human resources, as well as the creation of an environment conducive to the establishment of the NKU. JICA also provides support to SOEs that have received Kaizen services in anticipation of privatization, in terms of business management (marketing) up to privatization. The project is envisaged as a three-year technical cooperation project by JICA, and the development scenario is as follows

a. First year

- Compilation of the overall concept and creation of an action plan (with revisions made sequentially)
- Development of Kaizen Training tools and TOT manual.
- Human resource development for Kaizen trainer candidates (mainly classroom-based training)
- Human resource development through Japan invitation program and training in third countries aiming to form of external networks

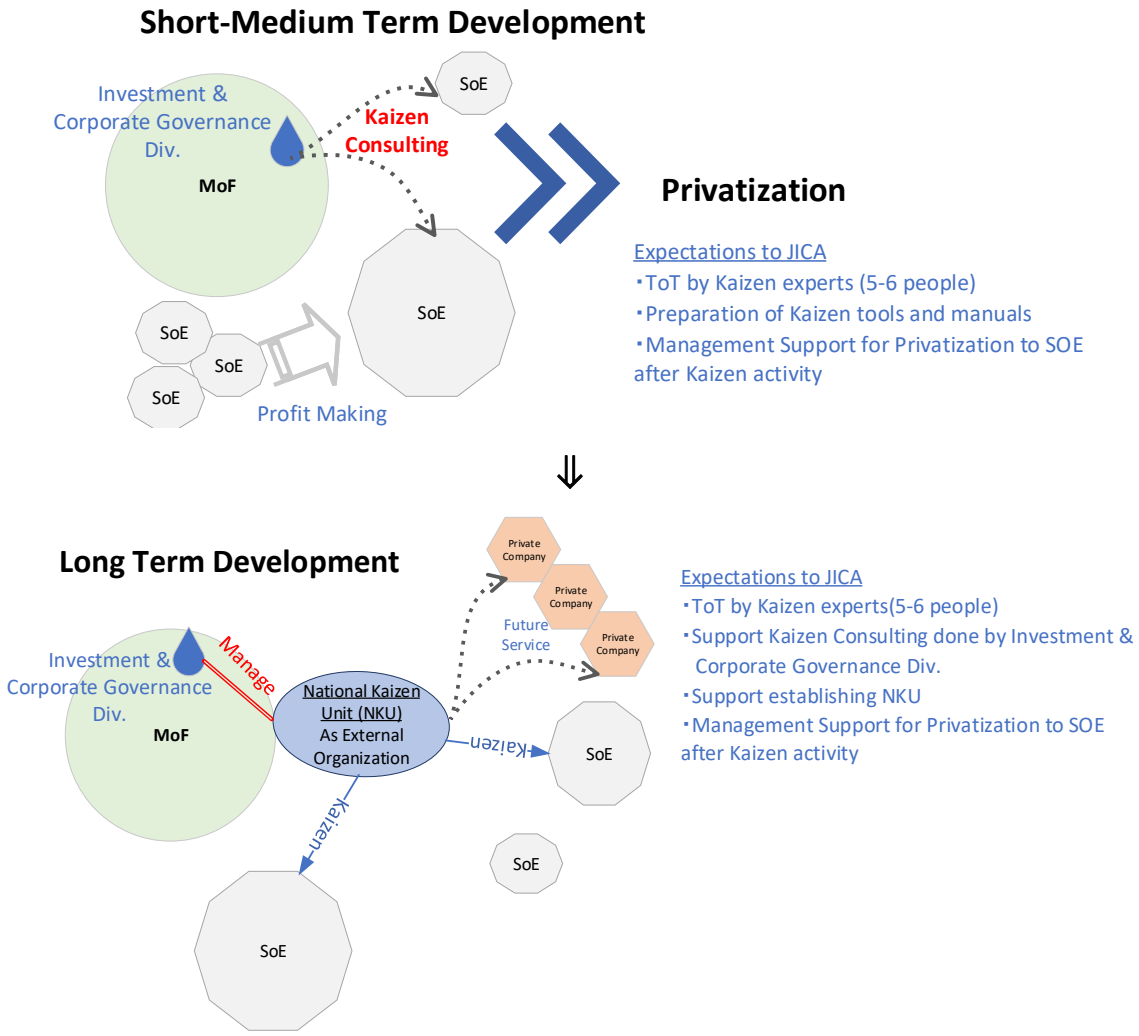
b. Year 2

- Revision of above plans, tools and manuals.
- Human resource development for Kaizen trainer candidates (classroom-based training + OJT at specific SOE)
- Human resource development through Japan invitation program and training in third countries aiming to form of external networks
- Support of business management[22] to SOEs that have received Kaizen services.

c. Year 3

- Guidance on Kaizen consulting
- Support of business management to SOEs that have received Kaizen services.
- Support for the realization of the NKU concept

[22] Kaizen practice and related research identified in the "Protocol for Supporting Reform of SOEs" and support for solving business issues that cannot be solved through Kaizen.



Source: JICA Survey Team

Figure 4-1 Image of proposed project

4.1.2 Goals of the Proposed Project

(Expected Results)

Outcome 1: The Investment & Corporate Governance Division of the MOF and the GCBS (hereinafter referred to as the Kaizen Team) in charge of Kaizen consulting will be established, and training tools and TOT manuals will be developed based on the team's business plan.

Outcome 2: Through necessary classroom training and on-the-job training for the Kaizen Team, at least five people will be trained who can provide Kaizen consulting

Outcome 3: A series of activities related to the "JICA's Protocol for Supporting Reform of SOEs" (hereafter referred to as the "Protocol") shown in Figure 4-2 (preliminary information gathering, Kaizen consulting, and solving issues that cannot be solved by Kaizen)[23] will be implemented for at least three companies that are the target of Kaizen consulting provided by the Kaizen team.

[23] Kaizen practice and related research identified in the "JICA's Protocol for Supporting Reform of SOEs" and support for solving business issues that cannot be solved through Kaizen.

Outcome 4: A development and operation plan for the NKU, which will carry out activities to disseminate knowledge and techniques for Kaizen, will be formulated.

(Summary of activities)

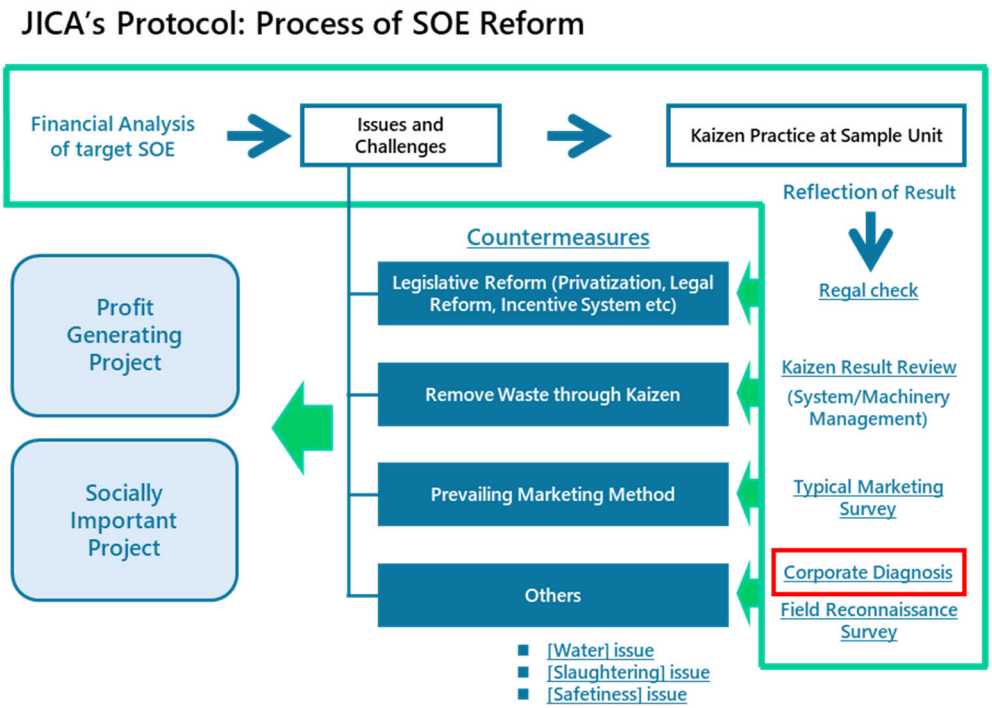
1-1. Investment & Corporate Governance Division of MOF will form a Kaizen team within the bureau.
1-2. The expert team prepares a three-year business plan and WBS for the three years of planned JICA support and obtains approval from the Kaizen team.
1-3. Review this survey in collaboration with the Kaizen team and develop a Kaizen training plan and protocol
1-4. Create the necessary Kaizen TOT tools based on the protocol.
1-5. Conduct financial analysis of SOEs under MOF jurisdiction using the most recent Bhutan State Enterprises Annual Performance Review, etc. (desk top analysis)
2-1. The Kaizen Team will develop/revise the Kaizen training program based on the training plan and protocol developed in Activity 1-2.
2-2. The Kaizen team will review the requirements for candidates to be trained to become Kaizen consultants and will select 6-7 candidates through a candidate selection process.
2-3. The Kaizen team will conduct Kaizen training for the selected candidates. The BLDCL_LPVAD conducted in this study will be used as a benchmark for Kaizen results as appropriate.
2-4. Kaizen teams will conduct study tours in other countries to benchmark good practices in Kaizen activities.
2-5. The Kaizen team will certify trained Kaizen consultants by conducting an appropriate competency assessment test on the trainees.
3-1. Determine candidate companies for Kaizen consulting based on the financial analysis conducted in Activity 1-5. Narrow down the number of candidate companies to about 4 while conducting detailed due diligence on each company.
3-2. The intention of the candidate companies and the forecast of the effects of Kaizen activities are conducted, and finally narrowed down to three companies that will implement Kaizen consulting.
3-3. Apply the protocol to the three narrowed-down companies.
3-4. The Kaizen team will work with the SOE concerned to examine measures to deal with issues that cannot be resolved by kaizen activities alone.
3-5. The Kaizen team will collect and analyze data on the impact of Kaizen activities implemented in the target SOEs.
4-1. The Kaizen Team will work with other government agencies to develop a plan for future kaizen training and dissemination to the private sector and others.
4-2. The Kaizen Team, in cooperation with other government agencies, will periodically review the Kaizen training and dissemination plan.
4-3. The Kaizen Team will monitor the activities of the NKU, as well as provide necessary budgetary measures and mobilize funds from other organizations.
4-4. The Kaizen team will hold Kaizen seminars, workshops, and meetings to share good practices.
4-5. The Kaizen team shall conduct public relations activities to disseminate Kaizen knowledge and techniques.
4-6. The Kaizen team will develop a basic framework and business plan for NKU using PPP and other methods.

(Lessons learned from this survey)

< Outcome 1 related >

- Considering Bhutan's Kaizen needs, the initial organizational and staffing structure of the Kaizen team should consist of one representative, one administrative staff member, and five Kaizen trainers.

- Kaizen trainers will be selected from the Investment & Corporate Governance Division of MOF and GCBS, which make up the Kaizen team. The number of trainers should be set to allow for a margin of 1-2 people to allow for drop-offs during the course of the project.
- The cost on the Bhutanese side will be the operational costs of the Kaizen team. With these personnel, and assuming activities from Outcome 2 to Outcome 4, the annual budget on the Bhutanese side is expected to be approximately US$70,000.[24]
- On the other hand, the Japanese side will provide five sets of the aforementioned protocol (see Figure 4-2) (30 million yen/Technical Assistance : TA), and assuming a three-year technical assistance project, activities similar to this survey will be conducted about once every five months (i.e., at least five SOEs can be approached in the same manner as this survey). (i.e., the same approach could be taken with at least five SOEs).
- Possible TOT tools include a syllabus for Kaizen training, Kaizen case studies (e.g., LPVAD videos), Kaizen-related educational materials, and training manuals.
- Conduct the financial analysis indicated at the beginning of the protocol for the 4 SOEs under the MOF umbrella using Bhutan State Enterprises Annual Performance Review, etc., to determine the financial status and Keep abreast of business conditions.



Source: JICA Survey Team

Figure 4-2 JICA's Protocol for Supporting Bhutan's SOEs

< Outcome 2 related >

- Conduct TOT training for selected TOT candidates based on the training plan and protocol developed in Activity 1-2.

[24] This is an estimate of the annual rent for the office, office operating costs, personnel costs (for 6 employees), costs for providing guidance to 2 pilot companies per year (travel expenses and daily allowances), and costs for holding 3 seminars per year, but depending on the nature of the work, it may be possible to reduce these costs.

- As for TOT's OJT, the LPVAD records of BLDCL will be used as evidence of Kaizen achievements. In addition, for on-site observation of Kaizen activities, the BLDCL's Kaizen dissemination sites will be used.
- Plan and implement training in Japan or third country for benchmarking Kaizen activities. Based on the effectiveness of the invitation to Japan in this survey, the following program of training plan in Japan is proposed.[25]

Box: Japan Training Plan

[1st]

Theme: To strengthen the capacity of the Kaizen team through knowledge acquisition of Kaizen and observation of good practices

Target: Kaizen team members

Implementation period: between the first and second year of the project

Duration: About 14 days

Main Content:

① Lectures on Kaizen (including Kaizen consultation techniques)
② Visits to companies and organizations which have good practice of Kaizen
③ Observation of value-added creation cases in similar industries of pilot companies
④ Lecture on the role of Kaizen promotion organizations
⑤ Elaborating an action plan to strengthen the capacity of Kaizen

[2nd]

Theme: Learn about the development of Kaizen dissemination in Japan and formulate a framework for NKU's development and management plan

Target: Executives of related ministries and agencies, Kaizen team members

Implementation period: between the second and third years of the project

Duration: About 14 days

Main Content:

① Japan's SME Policy and Support for SMEs
② Role of Kaizen Promotion Organizations
③ Visits to companies and organizations which have good practice of Kaizen
④ Developing a framework for NKU's development and management plan

- Based on the feedback from the JICA experts, the trainees will make efforts to overcome their weaknesses as Kaizen consultants.
- The Kaizen team will award certificates of competency to those who have completed TOT training.

< Outcome 3 related >

- Based on the contents of Activities 1-5, select SOEs 5_6 that may have potential for privatization and collect detailed data on their business and financials through interviews with CEOs and others.
- Of these, through Kaizen consulting, three SOEs were narrowed down as likely to benefit from improved productivity and operational efficiency.

[25] In this survey, several Asian countries where Kaizen is practiced are considered as opportunities of third country training as well as invitations to Japan. Although the survey team contacted productivity organizations in each of these countries, there were difficulties in accepting foreign trainees as well as differences in industrial structure. Therefore, the most feasible option at this time is to conduct training in Japan, while the possibility of future cooperation with neighboring countries and training in third countries should continue to be considered.

- Ad hoc surveys (legal survey, field survey, corporate culture assessment, etc.) will be customized according to the characteristics of the SOEs, and a team of JICA experts will support the implementation of the protocol.
- Issues that cannot be resolved by Kaizen alone are identified, and measures to address them are discussed in consultation with the SOE or MOF concerned and submitted as a "Problem Resolution Report.
- Collect and analyze data on the impact of the application of the protocol. The results will be compiled into a "Proposal for privatization of the SOE in question" and submitted to the target SOE and the Kaizen team.

< Outcome 4 related >

Support the dissemination and promotion of implementation of Kaizen activities as a national movement, and consider the concept of establishing NKU as a Kaizen hub in Bhutan to form networks with other countries for mutual learning.

- Develop a strategy and workflow for Kaizen dissemination activities. Particular emphasis will be placed on the NKU's management structure and mobilization of funds in order to consider the possibility of self-sustaining development.
- Organize Kaizen awareness seminars and workshops.
- Public relations activities to study the feasibility of introducing fee-based kaizen consulting to the private sector
- Collaboration with Kaizen promotion organizations in ASEAN countries (considering collaboration with Thailand, Malaysia, Cambodia, etc.)

4.2 Others (Dispatch of experts or volunteers)

The following requests were made by the target SOEs regarding the dispatch of individual experts or volunteers (see Table 4-2).

In the interest of time, JICA Survey Team have not been able to grasp the background to the detailed needs, other than the Meat Processing Expert requested by the BLDCL. However, the same requests of specialists viz. "Agricultural Products Distribution Specialist" and "Food Auction Specialist" have been made from FCBL in particular, which have been recorded since the "Data Collection Survey for Agriculture with and post COVID-19[26]" in 2021. JICA Survey Team proposes JICA Bhutan Office to investigate the relationship between the issues and the requests for the dispatch of experts, clarify the specifications for the dispatch of experts if possible and contact each SOE for the result.

[26] A JICA financed project conducted by Oriental Consultants Global and Sanyu Consultants Inc.

Table 4-2 Request of Specialist (experts or volunteers) to Japan in Target SOEs

SOE	Requested Specialist	Outline
BLDCL	Meat Processing Expert	▪ Technology transfer for manufacturing meat products (particularly sausages) ▪ Marketing methods for meat products according to rank
GBCL	a. Landscape Specialist	▪ Transfer of know-how for formulating development plans for tourism in national parks under management
	b. Park Waste Management Specialist	▪ Transfer of know-how for managing national parks through waste collection and the collection of maintenance fees, etc.
FCBL	a. Agricultural Products Distribution Specialist	▪ Transfer of know-how for developing distribution plans for agricultural products that vary by season and region ▪ Guidance on the effective use of cold chains
	b. Food Auction Specialist	▪ Acquisition of know-how for food auctions that can compete with those in India ▪ By expanding auctions in Bhutan, JICA survey team aim to raise farmers' motivation to cultivate and improve their marketing capabilities

Source: JICA Survey Team

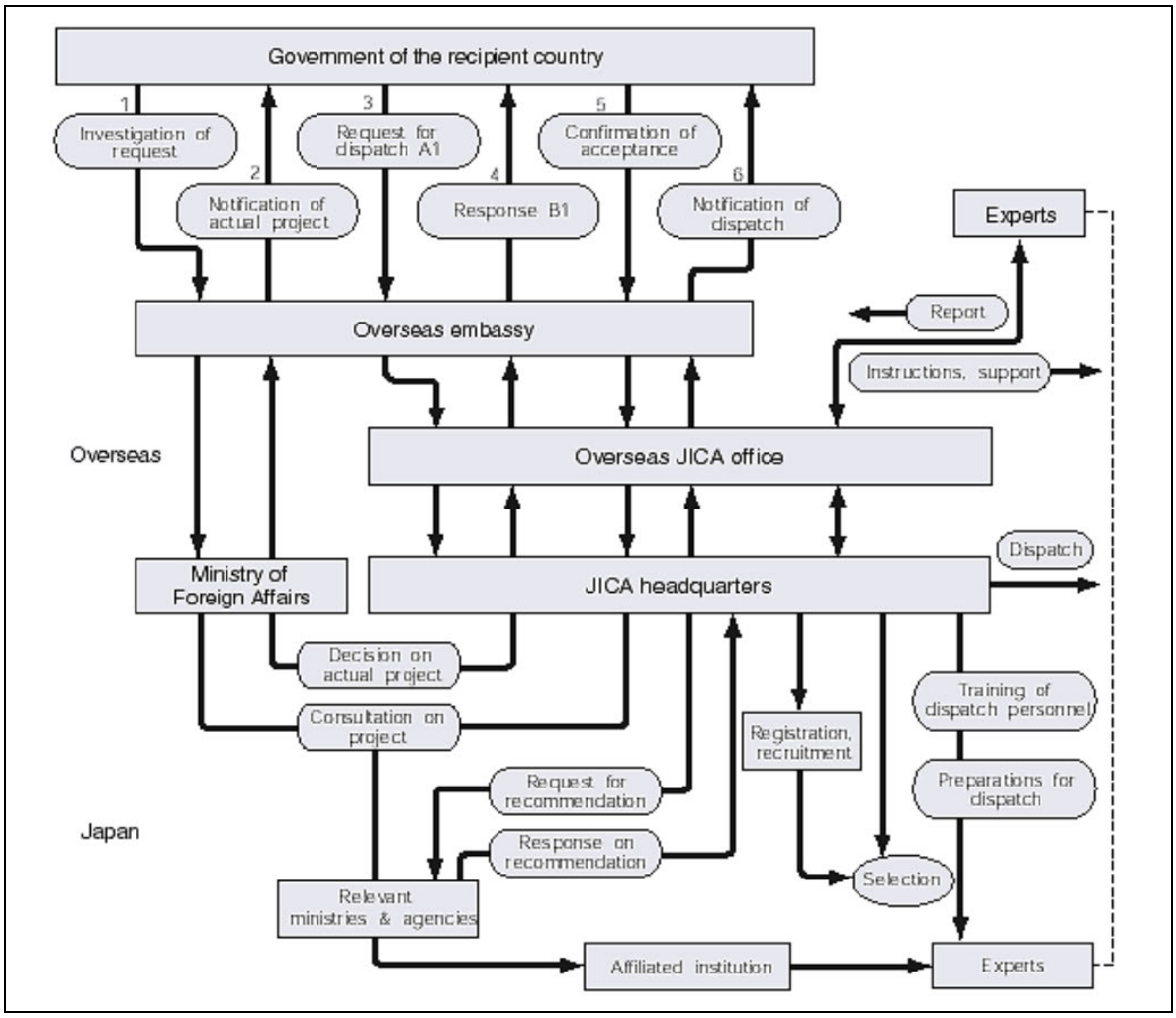
At first, BLDCL wanted to send experts who could maintain and manage existing facilities and manage operations. However, after realizing some of the success factors for commercializing the livestock business through the Japan Invitation Program, they changed their original request and strongly requested the dispatch of experts or volunteers who could "transfer technology for manufacturing processed meat products (particularly sausages)".

As mentioned in the previous chapter, Bhutan still does not have a system for setting meat prices by part, and because of this, the price per unit weight of livestock is the same regardless of the part of the animal → the added value of the meat does not improve / the taste and menu of the meat does not improve, and this situation is not only causing a lack of variety in the diets of the people, but also a situation where it is not possible to develop menus for tourists in the tourism industry.

In this sense, there is a strong desire for the dispatch of meat processing experts with real business experience.

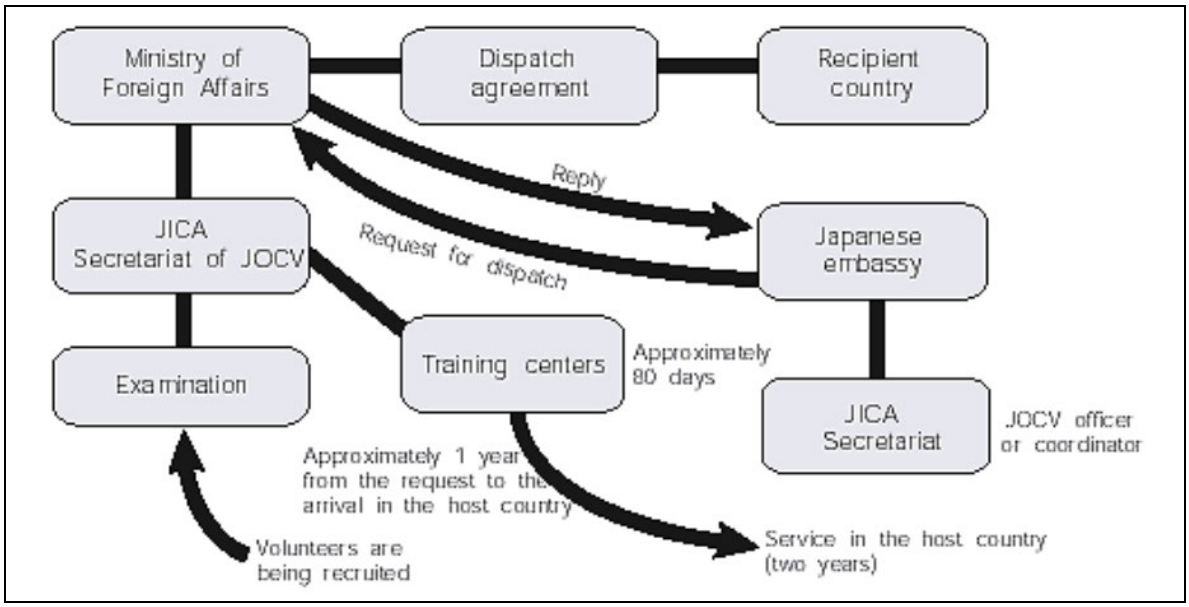
As Figure 4-3 and Figure 4-4 shows, in order to invite a specialist from Japan, it is necessary to follow the procedures for dispatching experts through official channels. The need for experts in meat processing at BLDCL, which was the subject of the Kaizen activities in this survey, is urgent, and these procedures may not be enough time.

Since the Bhutanese side is seeking to invite specific personnel, it is necessary to take measures such as cost sharing through direct negotiations with the relevant local government in Japan and the person's place of employment. The JICA Survey Team will continue to cooperate with this activity after the survey is completed.



Source: https://www.mofa.go.jp/policy/oda/guide/1998/2-4.html

Figure 4-3 Procedures for Dispatch of Experts



Source: https://www.mofa.go.jp/policy/oda/guide/1998/2-4.html

Figure 4-4 Mechanism of Dispatch of Volunteers from the Japan

Kingdom of Bhutan
Ministry of Finance

Data Collection Survey for Reforming Corporate Governance and Enhancing Productivity of State-Owned Enterprises in the Kingdom of Bhutan

Appendix

February 2025

Japan International Cooperation Agency (JICA)

Oriental Consultants Global Co., Ltd.
Sanyu Consultants Inc.
Japan Productivity Center

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APPENDIX 1 FINANCIAL DOCUMENTS OF STATE-OWNED ENTERPRISES (SOES) FINANCIAL ANALYSIS

1.1 Financial analysis indicator

In the Survey, a financial analysis was conducted on four selected companies. Twenty (20) external financial analysis indicators were used for the analysis. List of External Financial Analysis Indicators with their detail is shown into Table 1-1.

Table 1-1 List of External Financial Analysis Indicators with their detail

FS	Grouop	Indicators	Threshhold	Unit	Computation	divded by
CF	Safety	Operational CF Ratio	100	%	Cash Inflow from Operation	Cash outflow from Operation
CF	Safety	Operational CF Ratio (with subsidy)	100	%		
BS	Safety	Current Ratio	1		Current Asset	Current Liabilities
BS	Safety	Quick Ratio	1		Current Asset - Inventory	Current Liabilities
BS	Safety	Net Fixed Assets to Equity	1		Fixed Assets	Total Equity
BS	Efficiency	Inventory Turnover	45	days	Inventories*365	Gross Income
BS	Efficiency	Debtor Turnover	45	days	Receivables*365	Gross Income
BS	Efficiency	Creditor Turnover	60	days	Payables*365	Direct Material Cost
BS	Efficiency	Fixed Asset Turnover Ratio	1	Turns	Gross Income	Fixed Assets
BS	Efficiency	Total Asset Turnover Ratio	1	Turns	Gross Income	Total Assets
PL	Productivity	Gross Income per employee		000 Nu	Gross Income	Number of employee
PL	Productivity	Gross Profit per employee		000 Nu	Gross Profit	Number of employee
PL	Productivity	Employee cost/Gross Profit	0.5		Employee cost	Gross Profit
PL	Profitability	Gross Profit Ratio	10	%	Gross Profit	Gross Income
PL	Profitability	Ordinary Profit/Loss Ratio	100	%	Gross Income	Total Cost - Depreciation
PL	Profitability	Employee cost/Gross Income	50	%	Employee cost	Gross Income
PL	Profitability	Net Profit Ratio	0	%	Net Income After Tax	Gross Income
BS	Return	Total Asset - Operating CF Ratio	0	%	Net CF from Operation	Total Assets
BS	Return	Return on Assets	0	%	Net Income After Tax	Total Assets
BS	Return	Return on Equity	0	%	Net Income After Tax	Total Equity

Source: JICA Survey Team

1.2 Financial analysis for the four SOEs in this survey

The results of the analysis of the four SOEs are as follows:

(1) Bhutan Livestock Development Corporation Limited (BLDCL)

Table 1-2 Financial analysis of BLDCL

FS	Grouop	Indicators	Threshhold	2023	2022	2021	2020	2019
CF	Safety	Operational CF Ratio	100	72%	83%	68%	51%	41%
CF	Safety	Operational CF Ratio (with subsidy)	100	93%	88%	88%	96%	41%
BS	Safety	Current Ratio	1	0.83	0.78	5.73	5.60	0.23
BS	Safety	Quick Ratio	1	0.69	0.53	4.64	5.15	0.08
BS	Safety	Net Fixed Assets to Equity	1	1.78	1.72	1.32	1.10	1.13
BS	Efficiency	Inventory Turnover	45	46.72	54.68	24.60	55.54	44.01
BS	Efficiency	Debtor Turnover	45	192.08	109.03	75.86	48.25	13.18
BS	Efficiency	Creditor Turnover	60	149.14	92.78	11.25	47.00	125.13
BS	Efficiency	Fixed Asset Turnover Ratio	1	0.26	0.40	0.53	0.35	0.11
BS	Efficiency	Total Asset Turnover Ratio	1	0.22	0.34	0.45	0.21	0.11
PL	Productivity	Gross Income per employee		1,150.05	1,087.23	1,361.03		
PL	Productivity	Gross Profit per employee		345.89	186.98	248.30		
PL	Productivity	Employee cost/Gross Profit	0.5	1.12	1.81	1.36	20.68	6.21
PL	Profitability	Gross Profit Ratio	10	30%	17%	18%	2%	10%
PL	Profitability	Ordinary Profit/Loss Ratio	100	76%	77%	84%	64%	54%
PL	Profitability	Employee cost/Gross Income	50	34%	31%	25%	37%	60%
PL	Profitability	Net Profit Ratio	0	-25%	-38%	-31%	-2%	-159%
BS	Return	Total Asset - Operating CF Ratio	0	-7%	-7%	-15%	37%	-8%
BS	Return	Return on Assets	0	-5%	-13%	-14%	0%	-18%
BS	Return	Return on Equity	0	-12%	-26%	-22%	-1%	-20%

Source: JICA Survey Team

(2) Farm Machinery Corporation Limited (FMCL)

Table 1-3 Financial analysis of FMCL

			Threshhold	2023	2022	2021	2020	2019
CF	Safety	Operational CF Ratio	100	136%	268%	137%	225%	846%
CF	Safety	Operational CF Ratio (with subsidy)	100	168%	302%	188%	261%	2374%
BS	Safety	Current Ratio	1	1.10	0.74	0.87	2.62	1.60
BS	Safety	Quick Ratio	1	0.12	0.24	0.44	1.59	0.52
BS	Safety	Net Fixed Assets to Equity	1	0.91	1.83	1.35	0.41	0.61
BS	Efficiency	Inventory Turnover	45	531.35	257.51	221.61	258.07	533.22
BS	Efficiency	Debtor Turnover	45	52.73	118.32	70.59	61.44	238.72
BS	Efficiency	Creditor Turnover	60	2,809.22	679.62	457.44	483.98	1,086.45
BS	Efficiency	Fixed Asset Turnover Ratio	1	0.69	1.21	1.35	1.27	0.78
BS	Efficiency	Total Asset Turnover Ratio	1	0.32	0.53	0.50	0.39	0.29
PL	Productivity	Gross Income per employee				436.96		
PL	Productivity	Gross Profit per employee				211.49		
PL	Productivity	Employee cost/Gross Profit	0.5	0.77	0.51	0.43	0.71	1.27
PL	Profitability	Gross Profit Ratio	10	89%	46%	48%	49%	55%
PL	Profitability	Ordinary Profit/Loss Ratio	100	87%	84%	78%	84%	52%
PL	Profitability	Employee cost/Gross Income	50	68%	23%	21%	35%	70%
PL	Profitability	Net Profit Ratio	0	-6%	-20%	-1%	-7%	-5%
BS	Return	Total Asset - Operating CF Ratio	0	35%	-19%	-17%	-2%	4%
BS	Return	Return on Assets	0	-2%	-10%	0%	-3%	-1%
BS	Return	Return on Equity	0	-4%	-43%	-2%	-4%	-2%

Source: JICA Survey Team

(3) Food Corporation of Bhutan Limited (FCBL)

Table 1-4 Financial analysis of FCBL

			Threshhold	2023	2022	2021	2020	2019
CF	Safety	Operational CF Ratio	100	108%	116%	112%	99%	109%
CF	Safety	Operational CF Ratio (with subsidy)	100	111%	124%	119%	101%	112%
BS	Safety	Current Ratio	1	5.51	6.43	4.67	3.06	2.01
BS	Safety	Quick Ratio	1	4.20	4.86	3.14	2.06	1.30
BS	Safety	Net Fixed Assets to Equity	1	0.53	0.34	0.26	0.18	0.58
BS	Efficiency	Inventory Turnover	45	43.40	50.12	65.47	65.07	46.70
BS	Efficiency	Debtor Turnover	45	15.12	17.00	19.10	17.94	12.43
BS	Efficiency	Creditor Turnover	60	21.30	25.85	13.06	14.83	24.60
BS	Efficiency	Fixed Asset Turnover Ratio	1	5.04	7.25	10.03	14.36	8.36
BS	Efficiency	Total Asset Turnover Ratio	1	1.43	1.43	1.55	1.63	2.08
PL	Productivity	Gross Income per employee				4,798.02		
PL	Productivity	Gross Profit per employee				280.76		
PL	Productivity	Employee cost/Gross Profit	0.5	0.90	1.43	1.34	2.18	0.96
PL	Profitability	Gross Profit Ratio	10	7%	5%	6%	3%	11%
PL	Profitability	Ordinary Profit/Loss Ratio	100	96%	92%	94%	95%	98%
PL	Profitability	Employee cost/Gross Income	50	6%	8%	8%	7%	10%
PL	Profitability	Net Profit Ratio	0	1%	-3%	-2%	-4%	0%
BS	Return	Total Asset - Operating CF Ratio	0	13%	0%	-6%	-8%	-4%
BS	Return	Return on Assets	0	2%	-5%	-3%	-7%	-1%
BS	Return	Return on Equity	0	3%	-8%	-5%	-12%	-2%

Source: JICA Survey Team

(4) Green Bhutan Corporation Limited (GBCL)

Table 1-5 Financial analysis of GBCL

			Threshhold	2023	2022	2021	2020	2019
CF	Safety	Operational CF Ratio	100	106%	63%	46%	84%	49%
CF	Safety	Operational CF Ratio (with subsidy)	100	112%	70%	56%	93%	78%
BS	Safety	Current Ratio	1	20.42	16.05	4.77	5.80	15.03
BS	Safety	Quick Ratio	1	20.42	16.05	4.77	5.80	15.03
BS	Safety	Net Fixed Assets to Equity	1	0.41	0.40	0.30	0.44	0.44
BS	Efficiency	Inventory Turnover	45	0.00	0.00	0.00	0.00	0.00
BS	Efficiency	Debtor Turnover	45	115.60	237.98	239.93	46.19	62.33
BS	Efficiency	Creditor Turnover	60	11.82	49.19	59.74	4.95	43.54
BS	Efficiency	Fixed Asset Turnover Ratio	1	1.06	1.00	1.15	2.37	1.28
BS	Efficiency	Total Asset Turnover Ratio	1	0.41	0.37	0.28	0.90	0.53
PL	Productivity	Gross Income per employee				466.63		
PL	Productivity	Gross Profit per employee				220.21		
PL	Productivity	Employee cost/Gross Profit	0.5	0.71	1.46	1.29	0.76	1.29
PL	Profitability	Gross Profit Ratio	10	56%	43%	47%	32%	47%
PL	Profitability	Ordinary Profit/Loss Ratio	100	104%	71%	77%	94%	71%
PL	Profitability	Employee cost/Gross Income	50	40%	62%	61%	25%	60%
PL	Profitability	Net Profit Ratio	0	5%	-33%	-23%	-1%	-2%
BS	Return	Total Asset - Operating CF Ratio	0	0%	-44%	-6%	1%	-20%
BS	Return	Return on Assets	0	2%	-12%	-6%	-1%	-1%
BS	Return	Return on Equity	0	2%	-13%	-8%	-2%	-1%

Source: JICA Survey Team

APPENDIX 2 KAIZEN IN LIVESTOCK PRODUCTS VALUE ADDITION DIVISION (LPVAD)

2.1 Kaizen Activity Progress

Kaizen activities at LPVAD as a pilot site in the BLDCL were conducted from March to September 2024. The progress is shown in Table 2-1 Progress of Kaizen Activities at LPVAD.

Table 2-1 Progress of Kaizen Activities at LPVAD

Month	Details of implementation
Mar	・ Mini-workshop was conducted at LPVAD with CEO, director, manager and employees to identify issues ・ Workshop was held with CEO and managers of BLDCL to review issues identified at LPVAD and develop an action plan ・ Kaizen seminar was held to introduce basic Kaizen methods to BLDCL executives (a total of 10 SOEs were also invited)
Apr-Aug	・ LPVAD has updated Kaizen reports to show Kaizen progress and the Kaizen experts from the JICA survey team has provided additional advice through online monthly monitoring.
Sep	・ Mini-workshop was held for checking the progress together with LPVAD's employees ・ The Kaizen results were summarized by Kaizen expert according to the action plan items ・ Workshop and site visit to LPVAD was held for expanding Kaizen to other sites of BLDCL

Mini-workshop held at LPVAD to identify challenges (March)

Workshop to discuss action plan (March)

Observation and advice for implementing Kaizen

Mini-workshop held at LPVAD (September)

Presentation by LPVAD in a Workshop (September)

LPVAD site visit

2.2 Action Plan and Evaluation

The action plan and results reviewed by the Kaizen experts are shown in Table 2-2 Kaizen Action Plan and Results.

Table 2-2 Kaizen Action Plan and Results

Strategy 1: Eliminate inefficiency by applying basic Kaizen method				
No.	Actions	Focal Area/ Person	Result	
			Implementation	Effects
1-1	**Regular capacity building** - to do it better than the earlier activities they are doing through taking up the pieces of training **+Get feedback from employees**	Food Processing Area/ Dorji Khandu (OD), Dal Bahadur (GM),.	✓ Training of Kaizen was conducted 1 time. ✓ Internal meeting of action plan was held 2 times. ✓ 5S poster is made. ✓ Employees' feedback was collected.	✓ 11 ideas came up from employees of LPVAD ✓ The employees mindset is changed,. ✓ Manager do not need to say a lot for the following rule.
1-2	**Eliminate unutilized items/equipment-to** identify and list out the unutilized items **+ Arrangement of working area**	LPVAD Dal Bahadur (GM)	✓ 3 unnecessary equipment are removed. ✓ Slicer is placed apart from the packaging. ✓ Metal detector is installed.	✓ 3.139 m2 of space is created. ✓ Reduced the time for packaging of 100pkt from 40min to 20min through utilizing a bigger machine and allocating the person by using a working table (according to an employee). an employee).
1-3	**Daily inventory record-daily** inventory records of the stocks and finished products **+ Sales dealership**	Raw material (RM) & Finished Product (FP) warehouse Ugyen Lhamo (TO)	✓ Added a record for updating daily production and inventory. ✓ Dispatch record to Sales and dealership is improved by recording each dealer's shipment (before it was only the total amount).	✓ Updated inventory record is shared to the managers ✓ Make easier to ship to dealer quickly.
1-4	**Introduce Trolley for safety and time saving-trolley** to be used in order to lift the load and to save the time **+Reduced Work time/motion waste**	Work in progress (WIP) Dal Bahadur (GM), Suraj Ghally (CFO)	✓ A trolley is introduced. ✓ Planning to introduce steal meat rack and fork lift	✓ Reduced the time to carry from 7 min to 3 min. ✓ Reduced the working time at cold warehouse from 30 min to 10 min (according to an employee).
1-5	**Make checklist for cold room blast freezer and freezer vans-check** whether it requires maintenance or not. **+ Operational maintenance**	Cold Rooms Sherab Tenzin, Drivers	✓ 6 check list was made(cold room blast freezer and freezer vans, and smoking).	✓ Hyginee control is improved through raising awareness. ✓ Chek point of the quality of meat bacame more clear.
1-6	**Build FIFO system-first** seeing of the raw materials as well as dispatching of the finished products **+Labelling of Cold Store and space allotment**	RM & FP warehouse Tshering Choden (FT)	✓ Demarcation with steal pipe is introduced at cold warehouse. ✓ Products and dates are shown by tags with plastic cover.	✓ Products are stored and dispatched accordingly to FIFO ✓ The quarterly write off is reduced (Chicken 0.9Mt to 0 Mt and Pork: 0.4 Mt to 0 Mt.
1-7	**Standard Operation Procedures (SOPs) implementation**- Review and revise SOPs for individual and at the working level, including Visual SOPs **+Waste Reduction**	WIP & Warehouses Tshering Choden (FT)	✓ Different colors of boxes are used. ✓ SOPs are made for processing, freezer, hygiene.	✓ Risks of contamination are reduced. ✓ Wastes are reduced 17% by eliminating over or under cooking.

Note: Actions were added as Kaizen progress was made. The added contents are indicated by "+".

Strategy 2: Improve quality through the value chain

No.	Actions	Focal Area/ Person	Result	
			Implementation	Effects
2-1	**Train for farmers**	Contracted Farmers Mr. Dal Bahadur.	✓ One training is implemented by Mr. Dal Bahadur. ✓ Training material is developed. ✓ Production aggregation awaness training and meat processing training is planeed.	✓ The proper method is announced for improving quality. ✓ The standard size of chicken is informed to farmers.
2-2	**Train for LPVAD for developing new products**	LPVAD Dal Bahadur (GM)	✓ Budget is allocated from FAO (Total 100,000USD and some of them will be allocated for training.)	-
2-3	**Improve slaughter process**	BLDCL Mr. Dophu Dukpa (CEO)	✓ The required items are listed up. ✓ Discussion is ongoing. ✓ Budget is allocated.	-

Strategy 3: Build organizational structure to meet with market needs

No.	Actions	Focal Area/ Person	Result	
			Implementation	Effects
3-1	**Enhance communication across departments**	Head Quater (HQ) LPVAD / Marketing Mr. Dophu (CEO)	✓ The products are pushed to the market quickly by communicating with the marketing department. ✓ Big table is placed center of the office at HQ of BLDCL.	✓ The risk of long-term inventory is reduced (Before, it was sometimes stocked 6 months and loss of Nu. 3 million /year) ✓ Information can be easily shared. ✓ The communication between management and employees became easier.
3-2	**Make workplan**	LPVAD / Marketing Dal Bahadur (GM)	✓ Monthly and weekly target production is made (just starting from September)	✓ Make it easier to work ✓ The risk of the cross contamination can be reduced.
3-3	**Improve process for delivering to customer** (e.x. new project for Gyalsung Academies)	LPVAD / Marketing Dal Bahadur (GM)	✓ The procedure from receiving order to delivery is revised. ✓ The plastic bag is introduced for stocking and delivering meats.	✓ The faster delivery is achieved within 3 days (requirements from customer). ✓ The loss was reduced from 4-5% to 2% by using plastic bag.

2.3 Kaizen Activities and Summary by BLDCL

A summary presentation material of Kaizen activities prepared by BLDCL is attached in the following pages. The material is based on an update led by LPVAD managers and quality control personnel during the monthly monitoring and reflected the results by reviewing the sites together with the Kaizen experts.

The materials were used as material on the workshop which is held at the end of the support of Kaizen instruction.

Kaizen Implementation at LPVAD - Summary

BLDCL Thimphu

"A journey of a thousand miles begins with single steps"

1

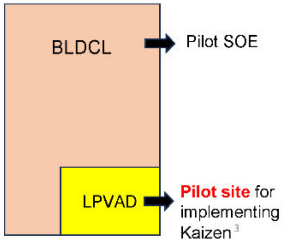
Outline

1. **Background**
2. **Introduction of Kaizen (Inaba)**
3. **Kaizen progress for eliminating inefficiency based on action plan**
   1) Regular Training for employees
   2) Eliminate unutilized equipment -Arrangement of working area
   3) Daily inventory record of finished products –Sales dealership
   4) Introducing trolley -Reduced Work time/motion waste
   5) Check list - Operational maintenance
   6) FIFO -Labelling of Cold Store and space allotment for different products
   7) SOP and Waste Reduction, color tray, Tote Bins
4. **Extension of Kaizen to value chain**
   1) Farmers Training
5. **Meet with Market needs**
   1) Set Weekly and Monthly target production volume
   2) Make Work Plan and assign responsible person
   3) Enhance communication
   4) Improved process to deliver to customer
6. **Outcome from Kaizen at LPVAD**
7. **Reaction from employees (Inaba)**
8. **Ongoing updates**
9. **Future plan**

2

1. Background

- ❖Initiated by the MoF, RGOB with support from JICA survey team
- ❖Introduction of Kaizen at LPVAD March end 2024
- ❖LPVAD selected as a pilot site of kaizen
- ❖Implementation period (March-September end 2024)



3

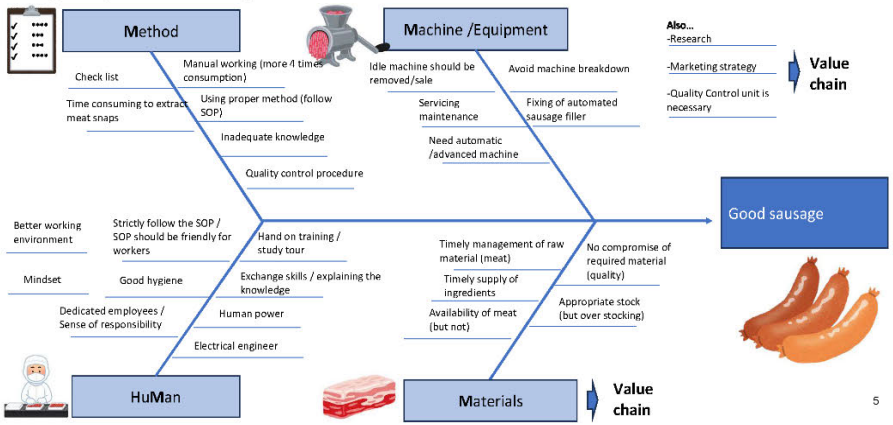
2. Introduction of Kaizen

Mini-Workshop at LPVAD

4

2. Introduction of Kaizen

Analysis by Fish bone diagram



5

2. Introduction of Kaizen

Workshop in BLDCL

6

2. Introduction of Kaizen

Objective and strategies:

Objective

Shift toward the market orientated business model

Strategies

Main scope of the Kaizen activities at LPVAD

(1) **Eliminate inefficiency** by applying basic Kaizen methods

(2) **Improve quality** through the **value chain**

(3)**Build organizational structure to meet with market needs**

* The direction and strategy 1 is elaborated through the workshop in March, 2024.
* The order of the strategies are modified in September, 2024.

Duration:

March-September, 2024

Pilot site:

Livestock Product Value Addition Division (LPVAD)

Kaizen initiative members:

Mr. Dophu Dukpa: CEO
Mr. Dorji Khandu: Director of Production
Mr. Dal Bdr. Mishra: Manager of LPVAD
Ms. Ugyen Lhamo; Livestock Production Officer
Ms. Tshering Choden; Quality control

7

3. Kaizen progress for eliminating inefficiency based on action plan

Main scope of the Kaizen activities at LPVAD

(1) **Eliminate inefficiency** by applying basic Kaizen methods

Made actions

1) Regular Training for employees + Get feedback from employees
2) Eliminate unutilized equipment + Arrangement of working area
3) Daily inventory record of finished products + Sales dealership
4) Introducing trolley +Reduced Work time/motion waste
5) Check list + Operational maintenance
6) FIFO +Labelling of Cold Store and space allotment for different products
7) Standardization +Waste Reduction

Added words in September

8

3. Kaizen progress for eliminating inefficiency based on action plan

1) Regular Training for Employees + Feedback from employees

- Basics on 5S, 7 types of wastes were presented.
- Presented video of Japanese automobiles to learn more about Kaizen principles
- Refresher training on implementation of SOP
- Conducted meeting thrice (2 on action plan, 1 on feedback from employees)

9

3. Kaizen progress for eliminating inefficiency based on action plan

1) Regular Training for Employees + Feedback from employees

5S poster to raise awareness

10

3. Kaizen progress for eliminating inefficiency based on action plan

1) Regular Training for Employees + Feedback from employees

Employee Feedback (Eliminate Inefficiency)

Sl#	Name	Designation	Suggestion/views
1	Sonam Tshoki	FT	-Pre-planning of workload, production planning -Packaging materials quality needs to improve
2	Dorji Dema	FT	-Teamwork, cooperation, mutual understanding
3	Arjun Gurung	FT	-FIFO implementation, overstocking need to be avoided -Need bio-security
4	Sanju Tamang	FT	-Requirement of PPE & Working Dress
5	Lobzang Choda	Driver	-Farmers' awareness during the harvesting of raw materials to maintain Quality -Personal hygiene needs to be maintained,

11

3. Kaizen progress for eliminating inefficiency based on action plan

1) Regular Training for Employees + Feedback from employees

Employee Feedback (Eliminate Inefficiency)

6	Karna Bahadur	FT	-Raw material quality needs to improve for less wastage, -Proper dressing with standard quality
7	Birkha Raj	FT	-discussion needs to be done beforehand to improve better services. planning of activities before 1 day -timely consideration, helping hand with the staff.
8	Pema Tsheten	FT	-Restriction of unauthorized visits during the time of production. Mainly for time management. To maintain acts of destruction
9	Laxman Rai	FT	-Sense of responsibility needs to be adapted
10	Ugyen Lhamo		-Self-adjustment along with the working period. -Strictly adaption of planning,
11	Tshering Choden	QCO	-Installation of foot dip at Exit area (Between production plant and Freezer building)

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3. Kaizen progress for eliminating inefficiency based on action plan

2) Eliminate unutilized equipment -Arrangement of working area-

Removed unutilized equipment

Before Kaizen

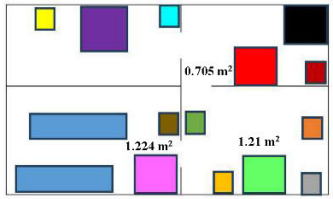
After Kaizen

3. Kaizen progress for eliminating inefficiency based on action plan

2) Eliminate unutilized equipment + Arrangement of working area-

Arrangement of working area

Before



Unused Machines
*Vacuum Tumbler

*Electric Roaster

*Deboning Machine

After

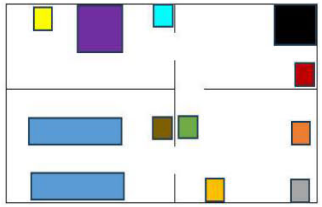


Table
Vacuum Packaging
Vacuum Packaging
Metal Detector
Smoke House

Cooking Kettle
Mixer
Mincer
Bowl Chopper
Sausage Filler

3. Kaizen progress for eliminating inefficiency based on action plan

2) Eliminate unutilized equipment + Arrangement of working area-

Sl No	Area of machine/ space occupied	Before	After
1	Vacuum Tumbler in Processing room (Area of machine= 1.21 m^2)	Area of processing room = 40.183 m^2	Area of processing room= 41.393 m^2
2	Electric Roasting Machine in Smoking room (Area of machine= 0.705 m^2)	Area of smoking room= 35.794 m^2	Area of smoking room= 36.499 m^2
3	Deboning Machine in Cutting room (Area of Machine= 1.224 m^2)	Area of cutting room= 22.026 m^2	Area of cutting room= 23.25 m^2

Total space created=3.139 m^2

3. Kaizen progress for eliminating inefficiency based on action plan

2) Eliminate unutilized equipment + Arrangement of working area-

Arrangement of washing area

Before

After

3. Kaizen progress for eliminating inefficiency based on action plan

2) Eliminate unutilized equipment + Arrangement of working area-
Arrangement of material

Before

After

Reduced searching time for tools

3. Kaizen progress for eliminating inefficiency based on action plan

2) Eliminate unutilized equipment + Arrangement of working area-
Arrangement of packaging area

Before

No working table so workers packing on the machine

According to an employee before to package 100 pkt of sausage, time taken is about 40 minutes, now its reduced to about 15-20 minutes.

Slicer but should not be placed here

After

Placed working table

Removed slicer to processing room and placed metal detector

Use table to place weighing balance and packaging material

3. Kaizen progress for eliminating inefficiency based on action plan

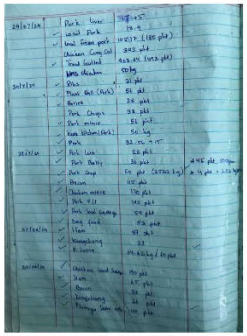
2) Eliminate unutilized equipment + Arrangement of working area-
Arrangement of local Processing Area

Before

After

3. Kaizen progress for eliminating inefficiency based on action plan

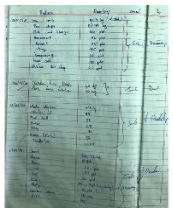
3) Daily inventory record of finished products + Sales dealership

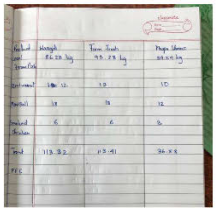


Daily Inventory record for product

i. Added one more record to update daily inventory and inform to manager

i. Dispatch records to sales and dealership is improved by recording each dealer shipment (Before it was only total amount)





Dispatch Record to Sales and Dealership

3. Kaizen progress for eliminating inefficiency based on action plan

4) Introducing trolley + Reduced Work time/motion waste

Before

This process was time and resource consuming with less efficiency

After

Less time and resource consumption

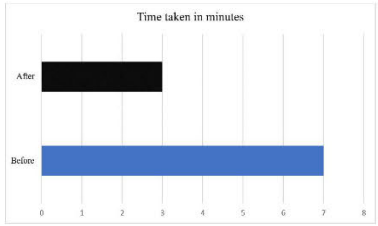
21

3. Kaizen progress for eliminating inefficiency based on action plan

4) Introducing trolley + Reduced Work time/motion waste

Before

- Before to carry 6 trays of product one person had to move six times up and down from production room to blast freezer which took about 7 minutes.



After

- After the introduction of trolley, transportation of heavy meat products is easier and also reduced the time and effort required for manual handling.
- With only two people required with the movement of products, others can focus more on processing task, leading to increased productivity.
- With introduction of trolley time in transporting have reduced from 7 to about 3 minutes.
- It also enhanced the safety of workers by minimizing manual lifting and carrying.
- According to an employee before he would take about 30 minutes in cold rooms in transporting raw material whereas now it takes about 10 minutes.

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3. Kaizen progress for eliminating inefficiency based on action plan

5) Check list + Operational maintenance

i. **Workers Checklist**
ii. **Raw material Checklist**
iii. **Finish goods checklist**
iv. **Tray Checklist**
v. **Vehicle checklist**
vi. **Maintenance checklist**

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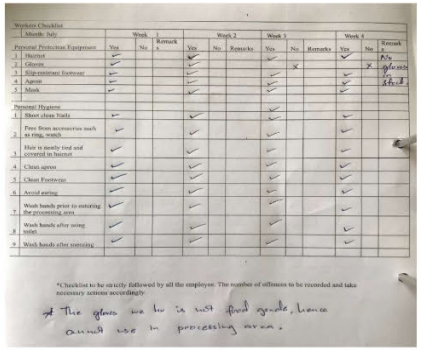
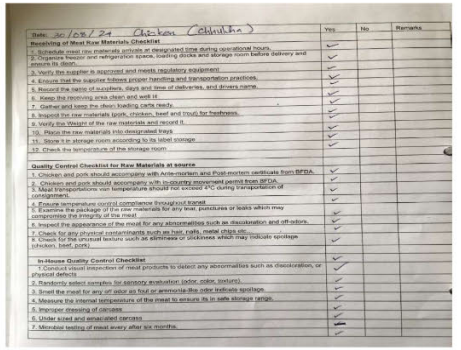
3. Kaizen progress for eliminating inefficiency based on action plan

5) Check list + Operational maintenance



Employee Checklist- awareness on personal hygiene



Raw Material Checklist-Receive good quality raw materials

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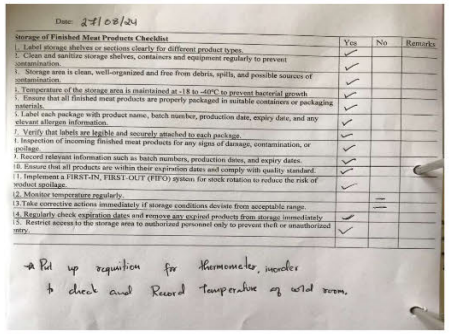
3. Kaizen progress for eliminating inefficiency based on action plan

5) Check list + Operational maintenance

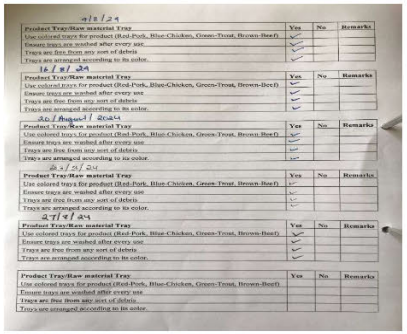


Storage of Finished Meat Products Checklist

	Yes	No	Remarks
1. Label storage shelves or sections clearly for different product types.	✓		
2. Clean and sanitize storage shelves, containers and equipment regularly to prevent contamination.	✓		
3. Storage area is clean, well-organized and free from debris, spills, and possible sources of contamination.	✓		
4. Temperature of the storage area is maintained at -18 to -40°C to prevent bacterial growth.	✓		
5. Ensure that all finished meat products are properly packaged in suitable containers or packaging materials.	✓		
6. Label each package with product name, batch number, production date, expiry date, and any relevant allergen information.	✓		
7. Verify that labels are legible and securely attached to each package.	✓		
8. Inspection of incoming finished meat products for any signs of damage, contamination, or spoilage	✓		
9. Record relevant information such as batch numbers, production dates, and expiry dates.	✓		
10. Ensure that all products are within their expiration dates and comply with quality standard.	✓		
11. Implement a FIRST-IN, FIRST-OUT (FIFO) system for stock rotation to reduce the risk of product spoilage.	✓		
12. Monitor temperature regularly.		—	
13.Take corrective actions immediately if storage conditions deviate from acceptable range.		—	
14. Regularly check expiration dates and remove any expired products from storage immediately	✓		
15. Restrict access to the storage area to authorized personnel only to prevent theft or unauthorized entry.	✓		

* Put up requition for thermometer, inorder to check and Record temperature of cold room.

Finish Goods Checklist-FIFO implementation



Product Tray/Raw material Tray

	Yes	No	Remarks
Use colored trays for product (Red-Pork, Blue-Chicken, Green-Trout, Brown-Beef)	✓		
Ensure trays are washed after every use	✓		
Trays are free from any sort of debris	✓		
Trays are arranged according to its color.	✓		

9/2/24

16/8/24

26/August/2024

28/5/24

27/9/24

Tray Checklist: identified tray for storage of different product

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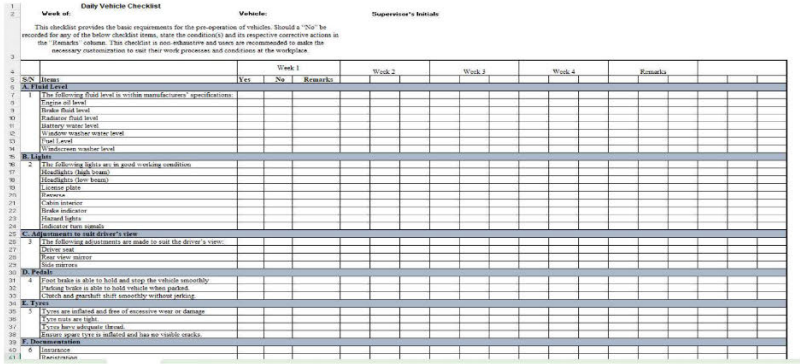
3. Kaizen progress for eliminating inefficiency based on action plan

5) Check list + Operational maintenance



Daily Vehicle Checklist

Week of: Vehicle: Supervisor's Initials:

This checklist provides the basic requirements for the pre-operation of vehicles. Should a "No" be recorded for any of the below checklist items, state the condition(s) and its respective corrective actions in the "Remarks" column. This checklist is non-exhaustive and users are recommended to make the necessary customization to suit their work processes and conditions at the workplace.

S/N	Items	Week 1 Yes	Week 1 No	Week 1 Remarks	Week 2	Week 3	Week 4	Remarks
A. Fluid Level								
1	The following fluid level is within manufacturers' specifications:							
	Engine oil level							
	Brake fluid level							
	Radiator fluid level							
	Battery water level							
	Window washer water level							
	Fuel Level							
	Windscreen washer level							
B. Lights								
2	The following lights are in good working condition:							
	Headlights (high beam)							
	Headlights (low beam)							
	License plate							
	Reverse							
	Cabin interior							
	Brake indicator							
	Hazard lights							
	Indicator turn signals							
C. Adjustments to suit driver's view								
3	The following adjustments are made to suit the driver's view:							
	Driver seat							
	Rear view mirror							
	Side mirrors							
D. Pedals								
4	Foot brake is able to hold and stop the vehicle smoothly							
	Parking brake is able to hold vehicle when parked.							
	Clutch and gearshift shift smoothly without jerking.							
E. Tyres								
5	Tyres are inflated and free of excessive wear or damage.							
	Tyre nuts are tight.							
	Tyres have adequate thread.							
	Ensure spare tyre is inflated and has no visible cracks.							
F. Documentation								
6	Insurance							
	Registration							

Vehicles Checklist- Schedule maintenance plan

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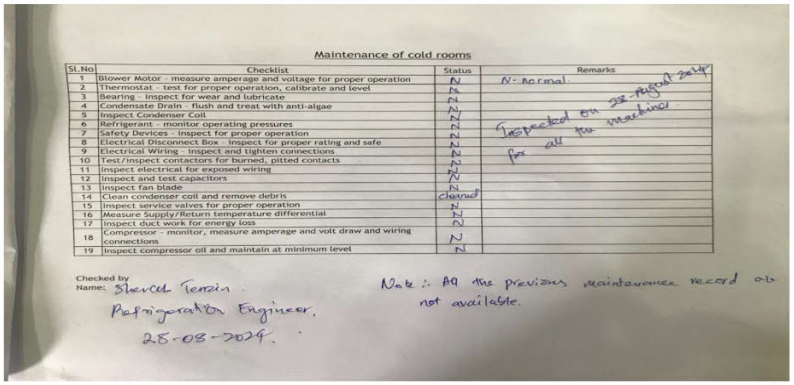
3. Kaizen progress for eliminating inefficiency based on action plan

5) Check list + Operational maintenance



Maintenance of cold rooms

Sl. No	Checklist	Status	Remarks
1	Blower Motor - measure amperage and voltage for proper operation	N	N- normal
2	Thermostat - test for proper operation, calibrate and level	N	
3	Bearing - inspect for wear and lubricate	N	
4	Condensate Drain - flush and treat with anti-algae	N	
5	Inspect Condenser Coil	N	
6	Refrigerant - monitor operating pressures	N	Inspected on 28 August 2024
7	Safety Devices - inspect for proper operation	N	for all the machine
8	Electrical Disconnect Box - inspect for proper rating and safe	N	
9	Electrical Wiring - inspect and tighten connections	N	
10	Test/inspect contactors for burned, pitted contacts	N	
11	Inspect electrical for exposed wiring	N	
12	Inspect and test capacitors	N	
13	Inspect fan blade	N	
14	Clean condenser coil and remove debris	cleaned	
15	Inspect service valves for proper operation	N	
16	Measure Supply/Return temperature differential	N	
17	Inspect duct work for energy loss	N	
18	Compressor - monitor, measure amperage and volt draw and wiring connections	N	
19	Inspect compressor oil and maintain at minimum level	N	

Checked by
Name: Sherab Tenzin
Refrigeration Engineer.
25-08-2024.

Note : All the previous maintenance record are not available.

Maintenance Checklist-Ensures if equipment are working at all time

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3. Kaizen progress for eliminating inefficiency based on action plan

5) Check list + Operational maintenance

Maintenance of refrigerated Vehicle

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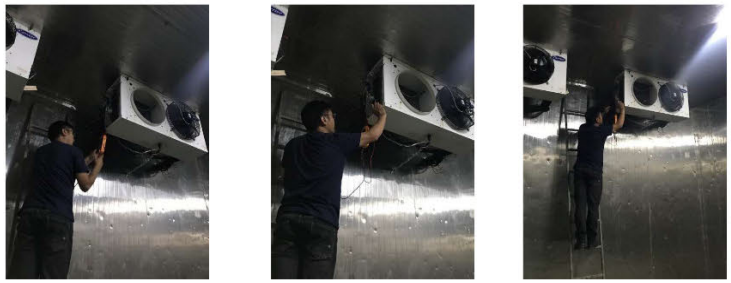
3. Kaizen progress for eliminating inefficiency based on action plan

5) Check list + Operational maintenance



General Maintenance of Cold room

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3. Kaizen progress for eliminating inefficiency based on action plan

6) FIFO +Labelling of Cold Store and space allotment for different products

Cold store

Before

After

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3. Kaizen progress for eliminating inefficiency based on action plan

6) FIFO +Labelling of Cold Store and space allotment for different products

Cold store

Before

Working

After

31

3. Kaizen progress for eliminating inefficiency based on action plan

6) FIFO +Labelling of Cold Store and space allotment for different products

Cold store

Challenges

- Lack of FIFO (Expired products)
- Used sticky notes on trays to carry out FIFO (the notes would come out)

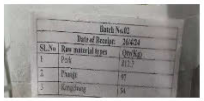
Before

As a initial step

Effect

- Immediate effect of FIFO
- Raw materials are processed by FIFO
- Product are stored and dispatched accordingly to FIFO

After



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3. Kaizen progress for eliminating inefficiency based on action plan

6) FIFO +Labelling of Cold Store and space allotment for different products

Outcome of introduction of FIFO

Before

- Older inventory becoming obsolete or expired, as it remain in the system longer as newer items are processed first.
- Increase the risk of waste and write off due to the potential for older stock being unused and expiring.
- Overstocking of inventory.

After

- Ensures that the first item to enter the system is the first one to be processed.
- Ensure that older stock is sold first.
- Reduces the risk of stock becoming obsolete or wasted.
- Minimizes the risk of having to write off of inventory due to obsolescence or expiry, as older items are handled first.

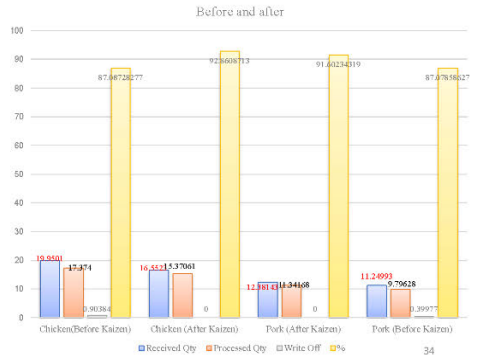
3. Kaizen progress for eliminating inefficiency based on action plan

6) FIFO +Labelling of Cold Store and space allotment for different products

Comparison in write off of meat

Quarterly write off

	Before Chicken (MT)	After Chicken (MT)	After Pork (MT)	Before Pork (MT)
Received Qty	19.95	16.55	12.38	11.25
Processed Qty	17.37	15.37	11.34	9.80
Write Off	0.90	0.00	0.00	0.40
Finished Goods quantity %	87	93	92	87



3. Kaizen progress for eliminating inefficiency based on action plan

7) Standardization +Waste Reduction

Allotment of Color crates for different products

Before

There were no specified trays for products which made it easy for cross contamination.

After

Trays are arranged color wise and only used for specified product to prevent cross contamination

3. Kaizen progress for eliminating inefficiency based on action plan

7) Standardization +Waste Reduction

Allotment of Color crates for different products

Before

After

Identified a place to place all the trays

3. Kaizen progress for eliminating inefficiency based on action plan

7) Standardization +Waste Reduction

Allotment by Color and shape for Tote Bins Site

Before

After

Specified particular site to place all tote bins

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3. Kaizen progress for eliminating inefficiency based on action plan

7) Standardization +Waste Reduction

Standard Operating Procedure (SOP)

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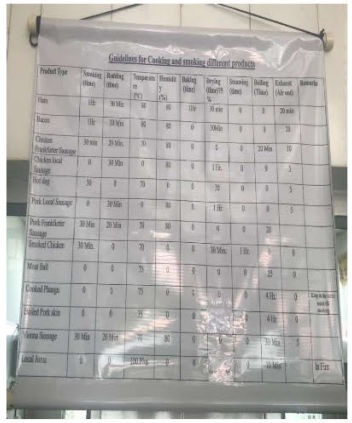
3. Kaizen progress for eliminating inefficiency based on action plan

7) Standardization +Waste Reduction

Standard Operating Procedure (SOP)

Following SOP have helped to minimize the occurrence of errors which ultimately minimize amount of defective products that would be rejected, hence reducing waste production.



3. Kaizen progress for eliminating inefficiency based on action plan

7) Standardization +Waste Reduction

Example: Product 300128

Before

Initial wt-110.06 kg
Product- 49.6 kg
Waste=54.93 %

Difference of waste rate = 9.38 %
(Reduced 17%)

After

Initial Wt-98.44 kg
Product- 53.6 kg
Waste=45.55%

Reduced wastes by avoiding over or under cooking through SOP

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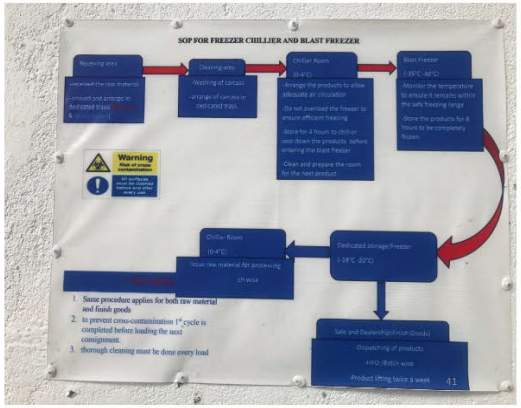
3. Kaizen progress for eliminating inefficiency based on action plan

7) Standardization +Waste Reduction

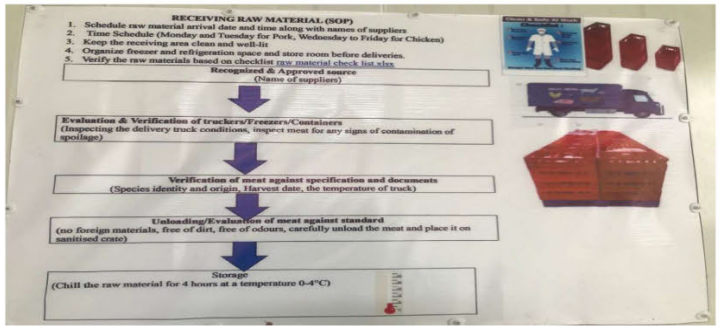
SOP for freezer and blast freezer



3. Kaizen progress for eliminating inefficiency based on action plan

7) Standardization +Waste Reduction

SOP for Receiving Raw Materials



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3. Kaizen progress for eliminating inefficiency based on action plan

7) Standardization +Waste Reduction

Outcome of SOP

- Achieve consistency
- Improve quality assurance and safety
- Increase productivity
- Enhanced comprehension, clarity and streamlined training.
- Reduce the risk of error
- Waste reduction by 17% through elimination of over and under cooking.

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4. Kaizen Extension to Value Chain

Training to Farmers

The main idea for farmers' training is to provide basic knowledge of Pork and Chicken processing

*Awareness to farmers on production and supply of good quality raw materials

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Farmers training (Chicken Production)

Chicken processing:

✓ Pre-slaughter care: How to handle to reduce stress and improve meat quality

✓ Slaughtering: Demonstration of a humane way slaughtering technique including cutting the jugular vein for quick blood drainage and ethical practices.

✓ Scalding and Plucking: Explanation on scalding (immersing the bird in hot water at 60-65 Degrees celsius. Manual and mechanical plucking methods were demonstrated.

✓ Evisceration: Demonstration of removing internal organs ensuring no contamination of meat

✓ Chilling and packaging: Importance of rapidly chilling to prevent bacterial growth. Demonstrate packaging for fresh and frozen chicken.

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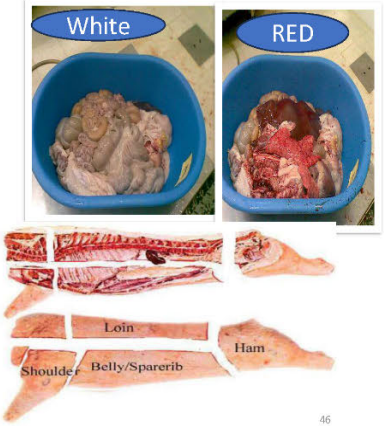
Farmers training (Pork Production)

Pork Processing:

- Pre-slaughter Care: Proper handling, reduce stress
- Slaughtering: Stunning and bleeding in humane way
- Scalding and Dehairing: Explanation of scalding pigs (60-70 degree Celsius)
- Evisceration & Splitting: Demonstration of removing organs and splitting techniques.
- Chilling and Butchering: The importance of chilling, carcass grading and cuts were covered.
- Packaging & Transportation: Ice use, storage conditions, and quality maintenance were covered.



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4. Extension of Kaizen to Value Chain

1) Training to Farmers

Outcome of farmers training

- Farmers are aware on supplying good quality raw material
- Size of the chicken improved from (3-5kg/chicken) to 1.8-2kg/chicken (ideally 1-1.5 kg)
- Shift from gasoline to hot water/ LPG gas torch.
- Improved cold chain by using enough ice during transportation
- Improvement in butchering (short legs and neck)
- Clean carcasses (Hair/fur removed properly)
- Reduced bruised carcass
- Pork portioning as per LPVAD requirement
- Proper removal of Internal offal in case of chicken

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5. Meet with Market Needs

1) Set Weekly and Monthly target production volume

Target production for pork

Product types	Weekly Target	Monthly Target
Tender Loin	16.5 kg	66
Loin	281 pk	1124
Ribs	124 pkt	496
Bones	138 pkt	552
Bacon	562 pkt	2248
Ham	689 pkt	2756
Frankfurter Sausage	246 pkt	984
Local Sausage	148 pkt	592
Hot Dog	148 pkt	592
Viena Sausage	148 pkt	592
Mixed Heb Sausage	222 pkt	888
Minced Pork	177 pkt	708
Pork Chips (Skin)	47 pkt	188
local frozen pork	613 kg	2452
Semi Cooked Phangu	35 pkt	140
Whole Phangu	35 kg	140
Local Juma	52.5	210

Target production for chicken

Products	Weekly Target	Monthly Target
Curry Cut	195 pkt	780
Breast	259 pkt	1036
Drumstick	130 pkt	520
Wings	90 pkt	360
Frankfurter Sausage	375 pkt	1500
Local Sausage	375 pkt	1500
Vienna Sausage	208 pkt	832
Hot Dog	208 pkt	832
Minced Chicken	438 pkt	1752
Whole Chicken	613 kg	2452
Dog Food	191.5 kg	766

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5. Meet with Market Needs

2) Make Work Plan and assign responsible person

Sl. NO	Day	Raw Material Receiving	Production
1	Monday	Receiving of pork raw materials from Yusipang and farmers • Carcass washing • Dressing • Segregation of carcasses for different products.	• Local products processing • Tenderloin/ Packaging • Extraction and curing of meat • Ham bacon extraction and curing
2	Tuesday	Receive pork raw materials if any • washing carcasses and keep frozen	• Sausage processing • Fresh cut, ribs, bones, loin • Packaging of local products
3	Wednesday	Chicken Raw material collection • Carcass washing • Freezing of products	• Fresh Cut • Whole Pack • Meat extraction and curing
4	Thursday	By evening receive trout Store in chilling room	• Sausage Processing • Curry cut • Dog Food
5	Friday	Trout processing and process for frozen • Through cleaning of plant	Processing of trout

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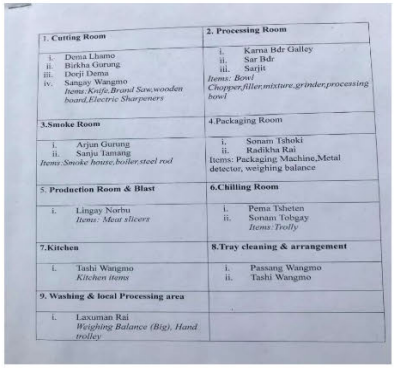
5. Meet with Market Needs

2) Make Work Plan and assign responsible person



i. Improved performance
ii. Enhanced productivity
iii. More Responsible
iv. Fewer errors

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5. Meet with Market Needs

3) Enhance communication

- LPVAD communicate more with marketing to deliver quickly to the market.
- Information is easily shared among the division
- Communication between management and employee became easier

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5. Meet with market needs

4) Improved process to deliver to customer (Example :Gyalsung academies)

Opportunity

- Enter to new Market
- Increasing brand recognition
- Increased demand and production
- Improved quality and standard of products
- Encourage and promote local production (Ready market for farmers and producers)
- Lower dependence on imports

Challenges

- Limited human resources resulting into heavier workload
- Limited Cold rooms
- Not able to get quality raw material
- No basic processing facilities in the fields

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6. Outcome of Kaizen at LPVAD

1. **Streamlining workflow:** SOPs/guidelines in each operation room, Removing unused equipment, Work divisions and Maintenance plan for vital equipment leads to fewer interruptions due to equipment failure and make it easier for the employees to do their assigned tasks.
2. **Improved Product Quality:** Farmers/ Employees training and eliminating the defects in the production process helped enhance product quality.
3. **Cost Saving:** Waste reduction by avoiding long-period inventory, SOPs and product development and diversification.
4. **Improve Efficiency and Productivity:** Streamlined the process: Better workflow in the processing stage resulting in increased productivity with reduced downtime.

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6. Outcome of Kaizen at LPVAD

- **5. Waste Reduction:** The training and collaboration with the primary production have helped in waste reduction. Products wise SOPs have also helped reduce waste significantly.
- **6. Enhanced food safety and compliance:** Regular review, monitoring and the improvement of sanitation have led to better compliance with the food safety regulations.
- **7. Reduced inventory and lead time:** After the introduction of Kaizen LPVAD has not done any write-off of finished products as well as material except for unwanted parts. Process improvement resulted in a quicker production cycle.

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7. Reaction from employees

✓A workshop was conducted to hear the voice of employees
✓The employees participated actively



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Reactions from employees



Mini-workshop at LPVAD on 12-September
Question: What do you feel the effect for Kaizen?
Answer by employees of LPVAD: As below

Section	Words from Employees
Processing:	**Working has become easier** and **hygienic with the proper maintenance of the machines, SOP** and new trolleys. Now no waste is produced while processing the products.
Cutting:	**The working area has become more spacious** and with the **unused machines removed. The works are done faster and easily now**, with improved SOP and easier sorting of the raw materials.
Smoke house room and local processing:	**Working has become more comfortable** and easier with more spaces, better SOP, timely machine maintenance, new equipment and trained workers.
Packaging:	**Working has become faster** and easier with properly assigned workers, standard SOP, new tables, metal detector and separate machines for separate activities. This also helps in producing clean and safe products.
Slicer room:	It has become easier to work with the additional machines, different room for slicing and standard SOP, which helps in producing properly sliced products.
Chilling room:	**Time spent in the chilling room has reduced with the introduction of different trolleys for different meat items and the specific arrangement and spacing for trolleys.** The clean trolleys also contribute to the clean storage.
Raw material warehouse:	**The time spent in the warehouse** has reduced due to **FIFO (Ex. from 30 to 10 min)** , proper labeling of raw materials (classification), assigning different places for different meat items and with the additional trolleys.
Finished goods warehouse:	Separate trolleys and spaces are allocated for different products which helps to save time. **Proper labeling and FIFO** was also a huge contribution in this.
Drivers:	The drivers feel **safer with timely vehicle maintenance and proper checklists**.

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Reactions from employees



Mini-workshop at LPVAD on 12-September
Question: what improvements can be made in the future.
Answer by employees of LPVAD: As below

Section	Words from Employees
Processing:	New machines and drain covers would be helpful along with **proper maintenance of the machines** and **fixing the automatic hand washing machine.**
Cutting:	New upgraded machines, cleaning and cutting materials along with proper safety measures, lighting maintenance and **workplan would enhance work efficiency.**
Smoke house room and local processing:	Requires bigger boiling containers, automatic water pressure machine, sausage hanger and electric oven.
Packaging:	**Needs additional tables**, flooring racks, tools/chair and proper lighting system with proper training to pack and label products.
Slicer room:	Bigger and more **stable tables** would increase the **work efficiency.**
Chilling room:	Requires more **trolleys**, PPE gloves, proper lighting and **timely maintenance** (AC/fans).
Raw material warehouse and Finished goods warehouse:	Requires racks, trolleys (forklift trolleys), **safety gears** (thick uniforms).
Drivers:	-

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7. Ongoing update

- Auto slicer and brine injector have reached the factory
- A fish gutting machine is installed at Haa
- Deployed 3 additional food handlers & 4 drivers in LPVAD
- Supply order placed for stainless steel meat racks for all the cold rooms
- Requisition submitted for equipment including Band saw/ meat saw, knife hanger, sharpening machine, high quality knives

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8. Future Plan

❖Training of all the employees supported by FAO

❖ Office shift to opposite blocks and make optimum use of processing plant (Lay-out changes)

❖ Extension of processing plant (Changing room)

❖ Replace old machines and installation of new machines

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Thank you

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2.4 Toward Further Kaizen Implementation

During the workshop at BLDCL in September, Kaizen experts gave the advice shown in Table 2-3 Advice for future Kaizen implementation in BLDCL.

Table 2-3 Advice for future Kaizen implementation in BLDCL

Items	Details
Continuation of monthly monitoring within BLDCL	With monthly monitoring by the Japanese experts, LPVAD recorded progress using the Kaizen Calendar, with the Kaizen initiative members playing a central role, and prepared presentation materials to show progress. These kinds of practices should be continued, as they are not only important for checking progress, but also for gaining management understanding and, in some cases, for making investment decisions. These kinds of practices should be continued, as they are not only important for checking progress, but also for gaining management understanding and, in some cases, for making investment decisions.
Prior consideration to avoid introducing unnecessary equipment	Through Kaizen activities, LPVAD first used "Red tape" to sort out and dispose of unnecessary items, creating new space and leading to an increase in work efficiency. On the other hand, equipment that is not being used or is not operating due to a lack of maintenance is a wasteful investment for BLDCL. Therefore, when introducing new equipment and facilities, sufficient consideration should be given in advance, and manuals and therefore, when introducing new equipment and facilities, sufficient consideration should be given in advance, and manuals and checklists should be prepared so that the equipment can be maintained sustainably.
Further opportunity to improve quality of meat through value chain	It was good that BLDCL extended the Kaizen activities to contracted farmers by preparing materials. There are cultural barriers when it comes to slaughtering methods, but by tackling the issues that are possible, it is expected that this will lead to improvements in meat quality.
Spreading Kaizen throughout the entire organization	The JICA survey team provided support for implementing Kaizen at LPVAD as a pilot site. Through the workshops at LPVAD, it was confirmed that not only did Through the workshops at LPVAD, it was confirmed that not only did work efficiency and quality improve, and losses and hygiene standards improve, but also that employee motivation increased. Based on the studies from LPVAD, it is expected that this will be expanded to other sites of BLDCL.

Source: JICA Survey Team

2.5 Survey for willingness of introduction of Kaizen

A survey was conducted among participants at the Kaizen Open Seminar held on January 29, 2025 to ask about their intentions regarding the introduction of Kaizen activities. The survey contents and results are as follows:

2.5.1 Objective of the survey

The purpose of this survey is to investigate the applicability of Kaizen after training for companies/organizations that have participated in Kaizen seminars conducted on 29 January 2025.

2.5.2 Method

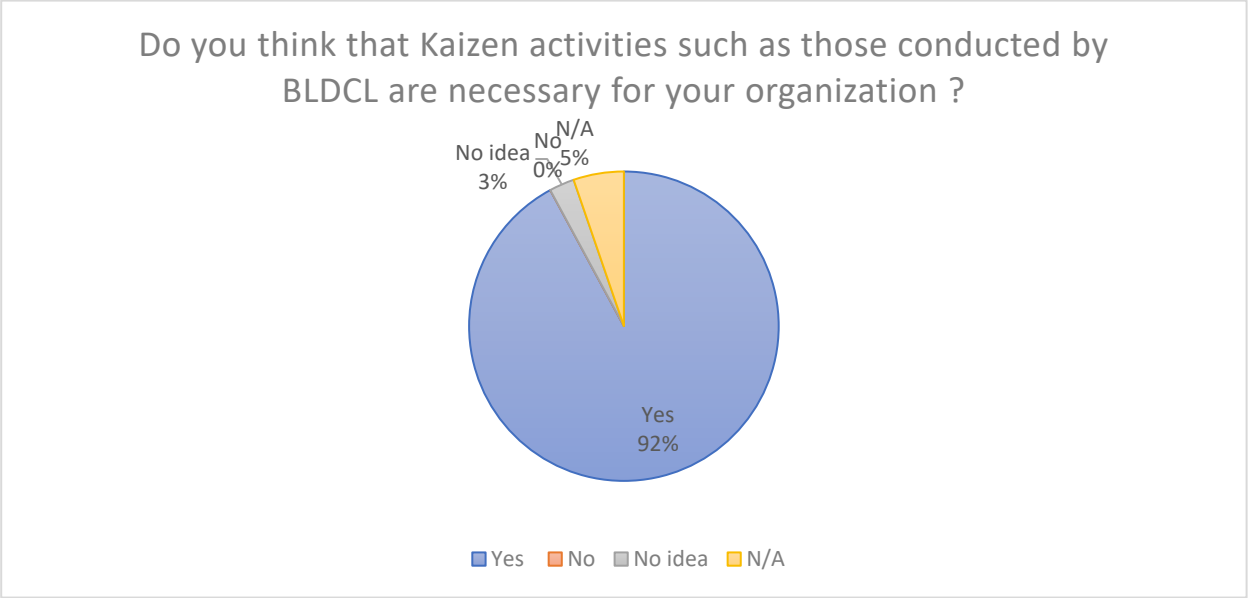
Distribution and collection of questionnaires to seminar participants (excluding executive guests, JICA officials, Survey team members)

2.5.3 Result

There were 54 seminar participants in total. After excluding the executive guests, JICA staff. and JICA Survey Team, the number of people eligible to receive the questionnaire was 46. Of these, 38 questionnaires were collected, and the results were tabulated based on this number. Any unanswered items were marked as "N/A".

(1) Necessity of Kaizen for respondents' organization

As shown in the chart, 92% of the respondents think that Kaizen activities should be conducted and is necessary for their organization/company. This reveals a predominantly positive attitude from the respondents.



Source: JICA Survey Team

Figure 2-1 Necessity of Kaizen for respondents' organization

(2) Problems wanted by solved by using Kaizen activity

The above questions were answered in free-response format and categorized into three main areas.

1) Issues you want to solve at your organization

The key issues faced by participants revolve around waste management, employee mindset, corporate governance, financial sustainability, and the need for innovation. The most frequently mentioned issue was waste management, particularly in inventory and motion waste, excessive paperwork, and administrative inefficiencies. The majority of the participants highlighted concerns about overproduction, disorganized documents, and ineffective resource utilization, emphasizing the need for better inventory control, e-procurement adoption, and streamlined administrative processes to reduce waste and improve efficiency.

Another recurring issue was the employees' mindset and workplace culture, with many participants citing a lack of proactiveness, ineffective teamwork, and limited cross-department collaboration. Employees often relied on supervision rather than taking initiative, affecting workplace efficiency. Strengthening communication, coordination, and employee engagement through a bottom-up approach could foster a more motivated and proactive workforce.

Financial sustainability was another critical issue, with concerns about high production costs, revenue stability, and succession planning. Participants emphasized the need for cost-cutting strategies while ensuring long-term financial growth, particularly in sectors like textile sales. With a strong emphasis

on expanding Kaizen principles across departments, improving marketing efforts, and fostering a culture of creative problem-solving will help the organization to achieve their success.

2) Number of staff to be involved

Almost all the participants believe that everyone working in their organization and company should be included in the Kaizen activities. As previously mentioned, to foster Kaizen and to get the best out of the best from its philosophy, Kaizen approach demands strong commitment and cooperation from everyone.

3) Key Performance Indicators (KPIs)

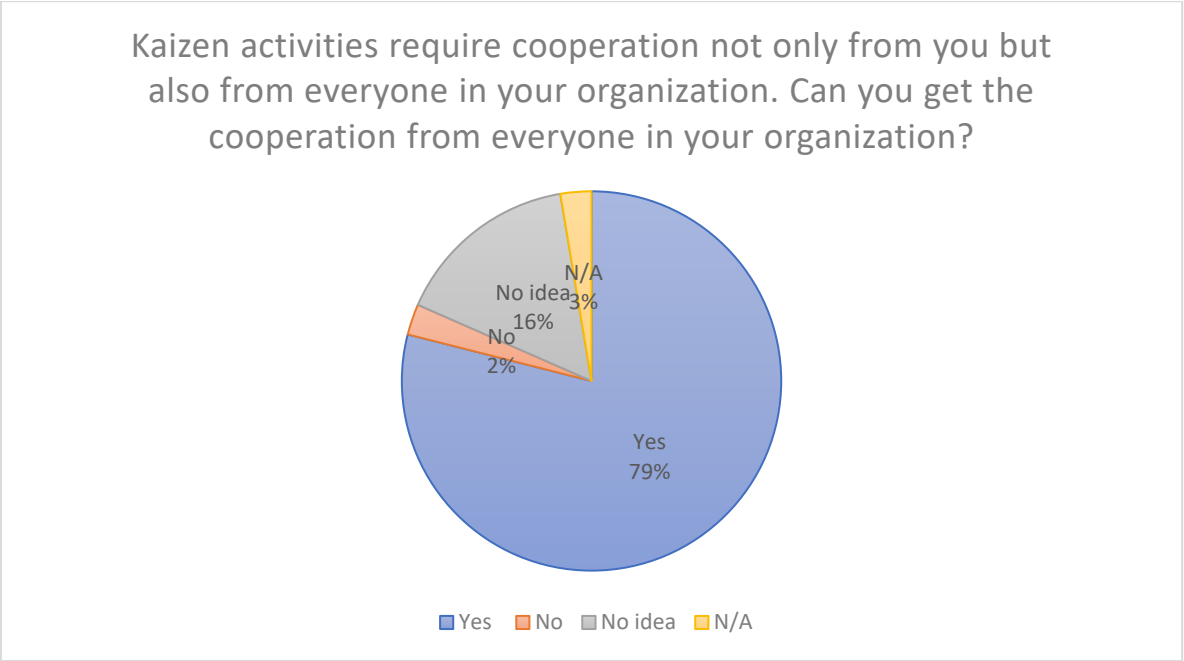
According to the participants, they identified several KPIs to address organizational challenges using Kaizen activities, focusing on efficiency, productivity, waste reduction, and employee engagement. One of the most recurring themes was work efficiency and productivity, with suggestions such as 5S implementation, structured work processes, better time management, and proper inventory systems. Participants emphasized the need to increase employees' efficiency, improve service delivery turnaround time, and enhance production quality and quantity.

Waste reduction was another critical area, with a focus on minimizing procurement costs, reducing the carbon footprint, and implementing Kaizen waste reduction practices. Many participants have highlighted the importance of better document organization to streamline workflow and facilitate easy access to past records. Employee engagement and organizational culture were also significant concerns, with participants stressing the importance of continuous improvement, accountability, talent acquisition, and performance management. In terms of governance, participants recommended holding regular coordination meetings and internal discussions to improve communication and problem-solving. Time management and prioritization of high-impact tasks were also suggested to maximize productivity.

The responses reflect a strong commitment to Kaizen principles, with a clear focus on waste reduction, efficiency improvement, structured workflows, and fostering a culture of continuous improvement.

(3) Cooperation for implementing Kaizen in organization

Although 79% of the respondents feel that they can get the desired cooperation from everyone in their companies and organization, there are few percentages of participants (16% with No idea indicating unsurety and 2% with No) that do not feel like they will receive equal participation for the Kaizen activities.

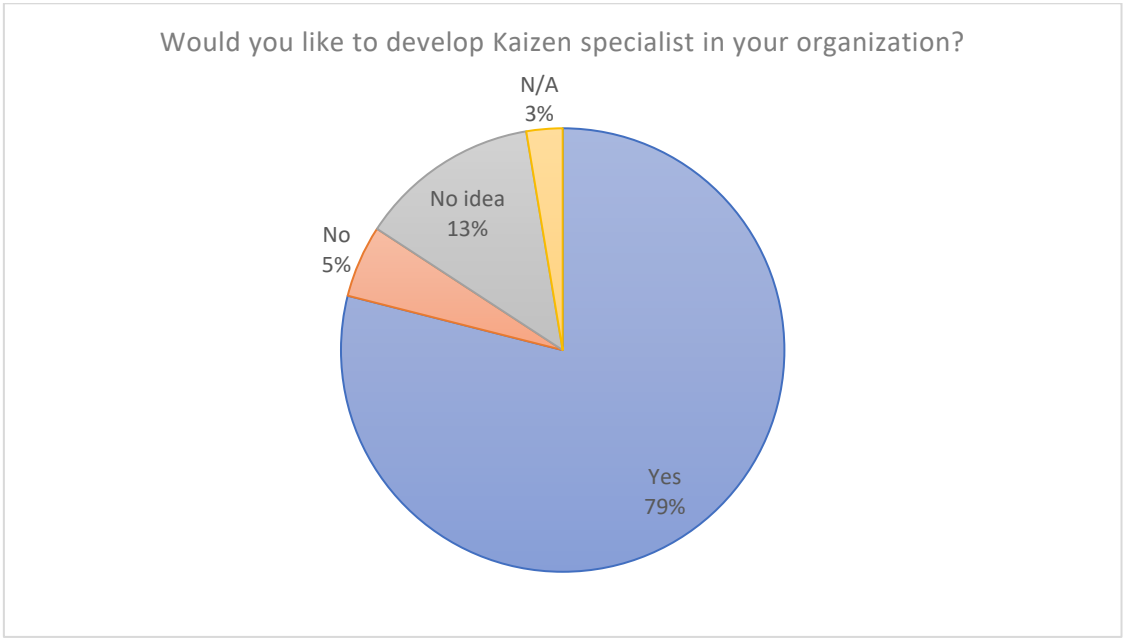


Source: JICA Survey Team

Figure 2-2 Cooperation for implementing Kaizen in organization

(4) Willingness to develop Kaien specialists in their organization

The majority of respondents (79%) would like to develop Kaizen specialists within their organization or company. However, there are a small number of respondents who answered "No" (5%) or "No idea" (13%).

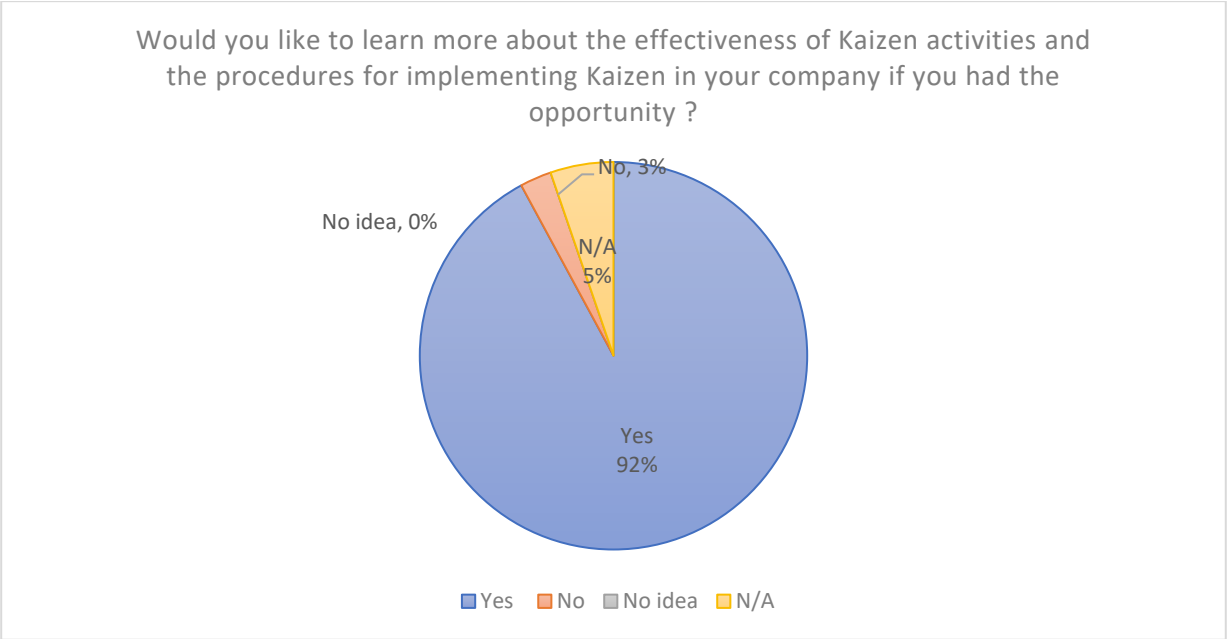


Source: JICA Survey Team

Figure 2-3 Willingness to develop Kaien specialists in their organization

(5) Willingness to learn more about Kaizen

From the illustration below, it can be confidently stated that most of the participants would like to learn more about the effectiveness of Kaizen activities and the procedures for implementation if given the opportunity. 92% of the participants showed positive perception towards Kaizen.

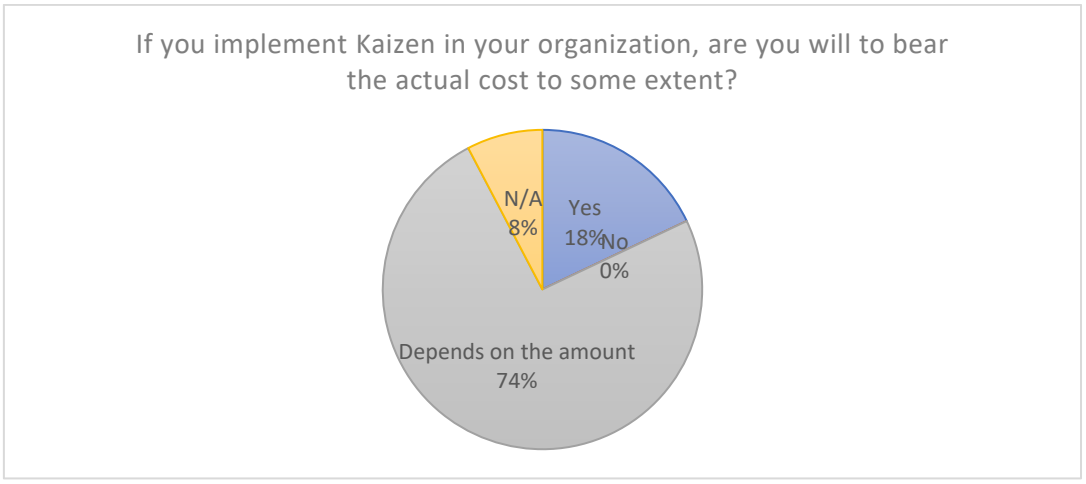


Source: JICA Survey Team

Figure 2-4 Willingness to learn more about Kaizen

(6) Willingness to bear the actual cost for Kaizen

74% of the respondents feel that despite the positive outcomes of Kaizen's approach, money is still an important matter to be considered. However, 18% of the respondents are confident enough to bear the cost regardless of the expenditure required. This indicates that there is a possibility that the company can bear the cost of making small investments and obtaining external advice associated with Kaizen.

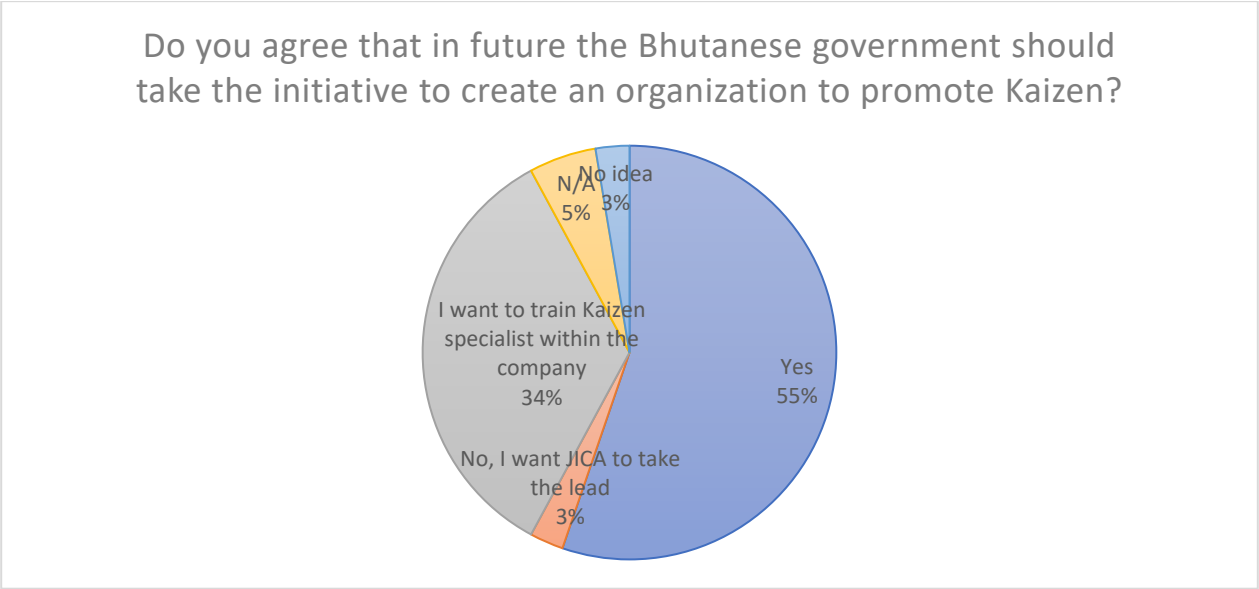


Source: JICA Survey Team

Figure 2-5 Willingness to bear actual cost for Kaizen

(7) Creating an organization to promote Kaizen

Majority of the respondents (55%) have agreed to government taking initiative to create an organization to promote Kaizen in Bhutan which further exemplifies the positive attitude around Kaizen. 3% of the participants want JICA to lead the Kaizen implementations. However, the 34% of the participants feel that training a Kaizen specialist within the company would be a better option and 3% of the respondents are still unsure about their decision towards government taking initiative to promote Kaizen by creating an organization.



Source: JICA Survey Team

Figure 2-6 Creating an organization to promote Kaizen

2.5.4 Summary

Of the respondents, 92% indicated that Kaizen is a necessity in their organizations, 79% indicated that they would like to develop Kaizen specialists in their organizations, and 92% would like to learn more about Kaizen. It would indicate a strong desire to introduce Kaizen, develop human resources, and deepen their knowledge.

In the free responses, production efficiency, overproduction, document management, administrative tasks, inefficient use of resources, information sharing, and employee mindset were cited as issues that need to be resolved. In addition to responses such as implementing 5S activities, reviewing work processes, improving inventory management, and introducing electronic management as solutions, there were also references to facilitating communication within the organization.

As for bearing the actual costs associated with Kaizen implementation, 92% of the respondents answered that they would "bear the costs" or "it depends on the amount," leaving room for consideration of bearing the costs associated with small investments, training, and consultation.

Furthermore, 55% of respondents agreed to create an organization to promote Kaizen in Bhutan, and 34% expect to train internal Kaizen specialists. Although there are differences between external and internal Kaizen personnel, it can be said that there is a need to develop human resources who can sustainably support the implementation of Kaizen in organizations.

The questionnaire that was conducted after the Kaizen Open Seminar is shown on the next page.

January 29 2025

Questionnaire Survey on Today's Seminar

The answers to the following questions will be compiled and used as a reference for future JICA projects. Thank you for your cooperation.

1. **Respondents' Attributes:**

Your organization	Position	Name

2. **Do you think that Kaizen activities such as those conducted by BLDCL are necessary for your organization?** (Mark ☑ if applicable)
   (☐Yes ☐No ☐No Idea)

3. **If you were in charge, what problems would you like to solve in your organization?**

Issues you want to solve at your organization	# of staff involved	Key Performance Indicators (KPI)

4. **Kaizen activities require cooperation not only from you but also from everyone in your organization. Can you get the cooperation of everyone in your organization?**
   (☐Yes ☐No ☐No Idea)

5. **Do you agree that in the future the Bhutanese government should take the initiative to create an organization to promote Kaizen?**
   (☐Yes ☐No, I want JICA to take the lead I want to train Kaizen specialists within the company ☐No Idea)

6. **Would you like to develop Kaizen specialists in your organization?**
   (☐Yes ☐No ☐No Idea)

7. **If you implement Kaizen in your organization, are you willing to bear the actual cost to some extent?**
   (☐Yes ☐No ☐Depends on the amount)

8. **Would you like to learn more about the effectiveness of Kaizen activities and the procedures for implementing Kaizen in your company, if you had the opportunity?**
   (☐Yes ☐No ☐No Idea)

JICA Information gathering and confirmation survey for productivity improvement in reforming state-owned enterprises in Bhutan

Source: JICA Survey Team

Figure 2-7 Questionnaire of Kaizen Open Seminar

APPENDIX 3 CORPORATE DIAGNOSIS OF BLDCL

3.1 Corporate Diagnosis of BLDCL

The BLDCL was identified as one of the five SOEs with poor annual earnings out of 15 SOEs under the Ministry of Finance (MOF) in the 2021 annual report of SOEs. In this survey, BLDCL was positioned as a precedent case for the reform of other SOEs. A detailed review of the BLDCL's business and financial structure was conducted to identify issues, and the Kaizen method was then applied to implement short-, medium- and long-term organizational reforms. The purpose of the corporate diagnosis of BLDCL was to complement these Kaizen activities in the following ways;

- To diagnose whether BLDCL or the target unit (LPVAD) have a business environment that is receptive to improvement activities.
- To diagnose whether there is an environment that can propagate the progress and results of Kaizen within the organization through open communication.
- To diagnose whether the leadership of the organization necessary for Kaizen activities has been sufficiently developed.

The diagnosis adopted the 'Diagnosis of Corporate Culture' application developed by the Nomura Research Institute in Japan in collaboration with Kobe University. The corporate diagnosis was managed by the company's Human Resources Unit, with the aim of having the Kaizen practice implemented under the ownership of BLDCL. As a result, it was possible to foster a sense of participation with all units of BLDCL participating.

3.1.1 Methodology

(1) Basic Concept

Perhaps the most vital factor exhibited in common by cases of successful Kaizen process innovation is full permeation and penetration of the intentions and aims of the program. It is apparently crucial to have a scheme for faithful reflection of the ideas of executive management right down to the front lines. Also important are human-centered contrivances for sharing of a staunch resolution, reward commensurate with effort, and empathy with employees, as well as measures to prevent any suspicion of unfairness.

Cases of failure present the opposite picture. The typical causes are excessive reliance on middle management as the agents of innovation, vague targets that open wide gaps of perspective between top and middle management as well as between management and the rank and file, and cold-hearted campaigns that do not take account of the human factor.

(2) Corporate Culture

"What is corporate culture?" It would be impossible to provide a hard and fast definition. The entity may be regarded as an outlook growing out of the company's history and shared by all its employees, as well as a manifestation of the company's values, one which sets its pattern of action. It is therefore akin to the behavioral norms extending to all parts of the company. Generally, it is described in terms of the company-wide atmosphere, e.g., "management from the top down," "paternalistic," etc. In promotion of corporate renewal, the chances for success will be lowered if the techniques applied do not match the corporate culture. Conversely, Kaizen can go very well if they are attuned to the corporate culture.

However, forceful attempts to alter the corporate culture are liable to encounter pitfalls. One such pitfall involves employee trust in management. A management eager to respond to sudden changes in the business environment may make rapid-fire revisions and adjustments of policy, plans, and strategy, giving the impression of not being able to make up its mind. Employees generally lose trust in such management, and on-the-job morale suffers consequently. From the resulting sluggish atmosphere in the office, however, management may conclude that it has been too "soft," and so start to "crack the whip." The scenario ends with the breakdown of what any unit dearly needs for survival under harsh circumstances – mutual trust among its members.

In light of such problems, it may be concluded that changing the corporate culture is certainly not an easy task and not the primary objective of reform or renewal. Nevertheless, it was also seen above that the corporate culture has a great influence on Kaizen activities. "What are the keys to remolding this apparent immutable?" Recent studies suggest that the single biggest element is a change at the leader, followed in order by a keen sense of crisis triggered by changes in the business environment, and organizational reform and redistribution of authority.

(3) Expression of corporate culture in terms of degrees of organizational and strategic vitality

Below, JICA Survey Team present a concrete method for reform of the corporate culture that proceeds from its attributes as described above. JICA Survey Team is using a database of information to quantify corporate culture in terms of "degree of vitality" as an indicator. Corporate culture is defined with reference to two such degrees of vitality, which together form a coordinate axis.

One is the degree of strategic vitality. It is manifested by indicators linked with the corporate result (i.e., rate of revenue increase, rate of profit increase, and capital profit rate), and expresses the enthusiasm for adaptation to the environment. It may be regarded as an indicator of the quantitative features expressing something along the lines of the company's degree of satisfaction.

The other is the degree of organizational vitality. It is manifested by indicators for items such as employee autonomy and organizational openness, and has often been used in the past for diagnosis of the corporate culture.

These two axes (degree indicators) each comprise sub indicators called "items." These items number 10 for degree of strategic vitality on the vertical axis and five for degree of organizational vitality on the horizontal axis (see Table 3-1). The composite vectors for these items determine the respective degrees of vitality.

Corporate culture vitality judgement & measurement

「Degree of strategic vitality」＝**Employee's environment change corresponding to corporate results (linked to achievements)**

①Strategic brains： Depth of strategic thought centered around the job
②Ideological leadership：Degree of actualization of management ideology
③Active reform： Stance for positive action for response to changes in the external environment
④Discharge of responsibility：Degree of effective execution of assigned duties and roles
⑤Merit Orientation：Emphasis on actual competence instead of seniority, academic achievement, or other such attributes
⑥Improvement campaigns：Degree of implementation of business process "kaizen," QC, and other activities for improvement
⑦Aspiration：Level of aspiration for the future of the company and the business
⑧Definition：Clarity of the definition of authority and responsibility, and of the related system of assessment
⑨Long-term outlook：Degree of emphasis on the long term as opposed to the short term
⑩Education：Extent of human resource development, OJT, etc.

「Degree of organizational vitality」 ＝**Employees degree of freedom, wellness (not linked to achievements)**

①Delegation of authority：Extent of delegation of authority to subordinates
②Respect for dialogue：Degree of respect for dialogue with subordinates on the floor; ease of constructive opposition
③Appropriate regulation：Appropriateness of rules for execution of the business process; fairness of control and system operation by superiors
④Respect for individual：Degree of respect for individual autonomy
⑤Tolerance of failure ：Degree of tolerance of failure and linkage of failure to improvement; extent of comeback by those committing failure

The different combinations of degrees of strategic and organizational vitality on the coordinate axis produce four main types of corporate culture (see Figure 3-1). The "Vibrant" type (upper right hand quarter) is that of first-rate companies where there is a good agreement between individual and corporate goals. However, very few companies can be placed in this quarter. The "Kintaro Candy" type (upper left-hand quarter) has a pronounced streak of administrative control and is typified by companies that are managed from the top down and turn in fairly good performances. It is prevalent among leading companies of medium standing and those listed companies that are owner-run.

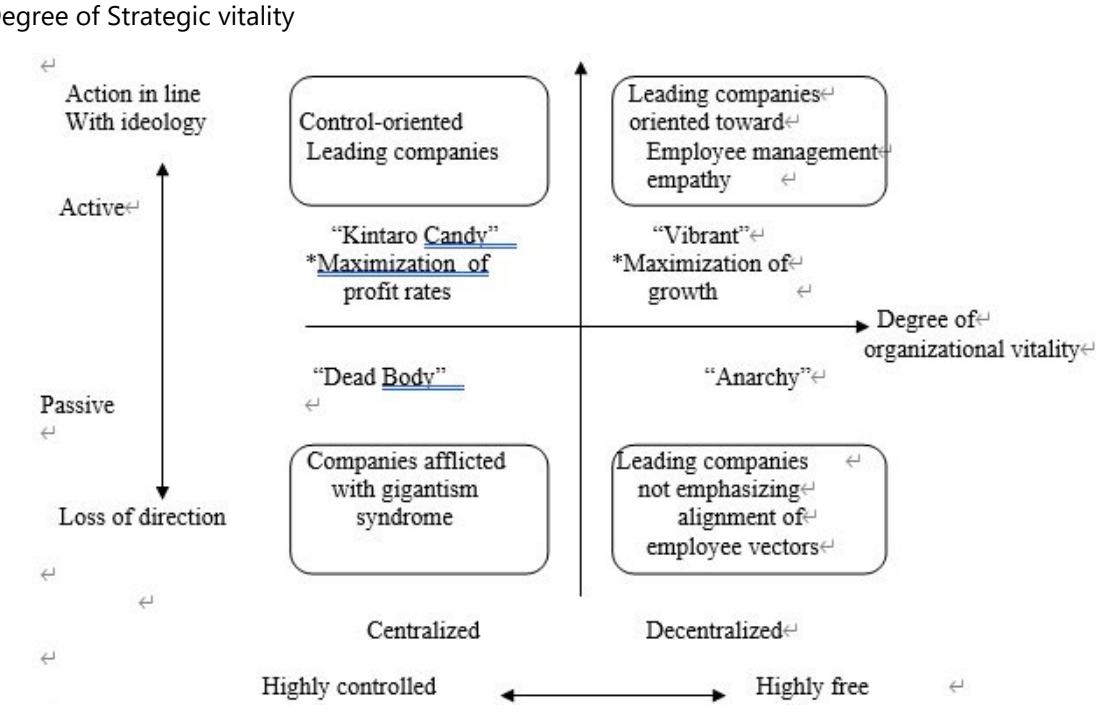
The types in the two lower quarters have lower degrees of strategic vitality. The "Anarchy" type (lower right-hand quarter) is found in companies where employees have a high degree of individual autonomy but are liable to be going in different directions. It is prevalent among manufacturers depending heavily on research and development, ad agencies, design offices, consulting firms, and other enterprises deriving much of their drive from the ingenuity of individuals. Most problematic is the culture with a plethora of rules without reason and a jungle of procedures in companies afflicted with "Dead Body" type (lower left hand quarter). It may be added that the items of leadership shown in the Table 3-1 often have a negative instead of positive value.

Table 3-1 Sub-indicators (items of corporate culture)

Degree of strategic vitality			
1)	Strategic brains	:	Depth of strategic thought centered around management on the job.
2)	Ideological leadership	:	Degree of actualization of management ideology.
3)	Active reform	:	Stance for positive action for response to changes in the external environment.
4)	Discharge of responsibility	:	Degree of eff. execution of assigned duties & roles.
5)	Merit orientation	:	Emphasis on actual competence instead of seniority, academic achievement, or other such attributes.
6)	Improvement campaigns	:	Degree of implementation of business process. "Kaizen," Quality Control (QC), and other activities for improvement
7)	Aspiration	:	Level of aspirations for the future of the company and the business.
8)	Definition	:	Clarity of the definition of authority and responsibility, and of the related system of assessment.
9)	Long-term outlook	:	Degree of emphasis on the long term as opposed to the short term
10)	Education	:	Extent of human resource development, On the Job Training (OJT), etc.

Degree of organizational vitality			
1)	Delegation of authority	:	Extent of delegation of authority to subordinates.
2)	Respect for dialogue	:	Degree of respect for dialogue with subordinates on the floor; ease of constructive opposition.
3)	Appropriate Regulation	:	Appropriateness of rules for exec. Of the business process; fairness of control & system operation by Superiors.
4)	Respect for the Individual	:	Degree of respect for individual autonomy.
5)	Tolerance of Failure	:	Deg. Of tolerance of failure & linkage of failure to improvement; extent of comeback by those committing failure.

Source: JICA Survey Team



Source: Nomura Research Institute, Japan

Figure 3-1 Four types of corporate culture

Table 3-2 Supplement items of management leadership

1)	Consideration	:	Ability to understand subordinate's feelings, troubles, and problems
2)	Presentation of goals	:	Presentation of specific goals to subordinates
3)	Power of Influence	:	Power to negotiate with other units and superiors of the same unit, and to lead a team forward.
4)	Grooming	:	Ability to present an example; stance of and competence in grooming subordinates.
5)	Pressure to achieve	:	Ability to motivate for achievement of tasks

Source: Nomura Research Institute, Japan

(4) Implementation Process

Process of diagnosing the corporate culture began with a survey of employees to obtain basic data (the questionnaire contained a total of 73 questions). The survey was conducted with all employees, including the Administrator. The survey results were quantified so that they could be classified into the aforementioned types. At this stage, the factors that shape the corporate culture become quite clear. In the next step, data on the factors behind the values of the item indicators were collected and analyzed through individual interviews (online) with the leaders of each unit. The results were shared with the Administrator, Director, and MOF first and partially with the staff of BLDCL based on the Administrator's decision.

In order to achieve a "vibrant" corporate culture with high organizational and strategic vitality, it is essentially necessary to satisfy the following requirements: 1) a flexible and simple organizational structure; 2) active communication; 3) formation and organization that is appropriate to the content and importance of decision-making, the difficulty of work, the weight of responsibility, the level of leadership, etc. Furthermore, 4) evaluation based on results, there must be a provision for rewards for challenges, 5) human resource development from a long-term perspective, and 6) the recognition that change is inevitable is necessary.

3.1.2 Implementation Process on this JICA Survey

The implementation process for this survey is as follows.

(1) Target：

All BLDCL employees, including top management (see Table 3-3)

Table 3-3 Number of Employee at BLDCL (March 2024)

Department	Unit	Division	Male	Female	Total
CEO			1		1
Officiating Director			1		1
BOD			3	1	4
IA			0	0	0
CS&Legal			0	0	0
1.Business Development Sales and Marketing	Sales and Distribution		3	0	3
	Marketing & Research		0	0	0
	Direct Suppliers-School Gelsung etc.		2	0	2
	Business Review		0	0	0
2.Production, Investment & Supply Chain Management	Farm/Unit	LPVAD**	15	9	24
		Yusipang Piggery	4	2	6
		Haa Trout	4		4
		Sarpang Layer	13	8	21
	Farm Focal & Review		1		1
3. Corporate Governance	Accounts		3	1	4
	Adm&HR		3	3	6
	IT & Procurement			1	1
	Security		0	0	0
	Investment Review		0	0	0
4. Integrated Livestock Production Samrang			21	6	27
Total			74	31	105

** Livestock Production Value Addition Division

Source: JICA Survey Team

(2) Implementing Schedule

- 7th to 8th March 2024: Administrator and Human Resource (HR) Department to define analysis perspectives (see below) and prepare questionnaires (online)
- 13 March 2024: Administrator and HR department announce the survey to all employees
- 15-20 March 2024 (6 days): Employees respond to the questionnaire, and the results are collated. On 18 March, the Administrator reminds those who have not yet responded.
- 20 March 2024: The results are reported at a seminar
- 24 March 2024: Detailed results reported to BLDCL top management (Administrator and Director).
- April to May 2024: Summary results reported to unit leaders (online) at the request of the Administrator.

The results of the leader reports were compiled and reported to BLDCL top management and are also included in this report (confidential).

3.1.3 Perspective of Analysis

The diagnostic program allows the implementer to set the perspective freely, taking into account the characteristics of the segments that are rooted in the organization, such as by age or gender. In this case, while consulting with the top management and HR department of BLDCL, JICA Survey Team conducted an analysis based on the following nine (9) perspectives, in addition to the overall level of vitality of BLDCL (see Table 3-4).

Table 3-4 Perspective of the Analysis

1.Job Category		4. Unit: See the Table 3 above		8. Salary Satisfactory	
a. CEO	1	5.Marital Status		a. Yes	63
b. Executive	1	a. Married	79	b. No	32
c. Professional/ Managerial	11	b. Unmarried	15	9.How many years do you ish to work at BLDCL	
d. Supervisory Support	12	c. Divorce	2	a. More then 10 Years	58
e. Operational Support	71	6 Educational Background		b. More then 5 Years	24
2.Age		a. PHD	0	c. Less then 5 Years	13
a. 29 or less	28	b. Master	2	d. Immediately change	1
b. 30-34	24	c. Degree	9		
c. 35-39	21	d. Diploma	4		
d. 40-44	11	d. Class XII	20		
e. 45-49	6	e Class X and below	35		
f. 50-54	4	f. Uneducated	26		
g. 55-59	2	7. Job Satisfactory			
3.Sex		a. Yes	63		
a. Male	67	b. No	32		
b. Female	29				

Source: Corporate Diagnosis Survey at BLDCL

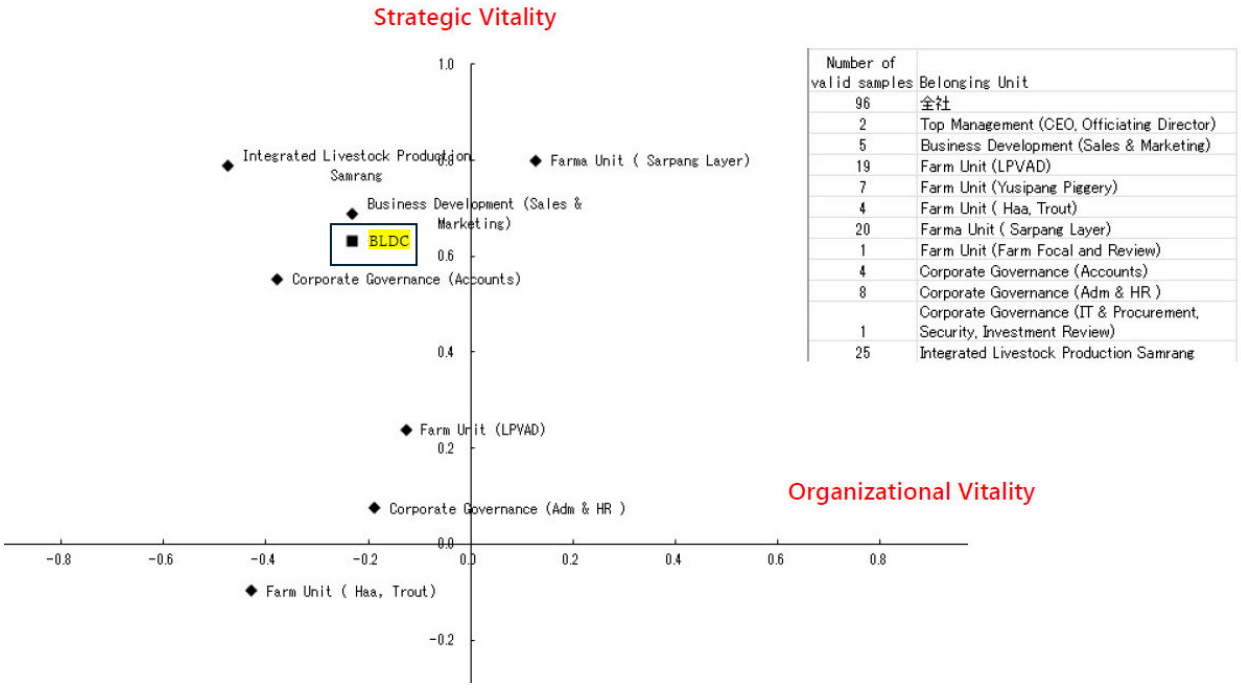
JICA Survey Team requested that 101 people (excluding the 4 Board of Director (BOD) members) take part in the survey, and received responses from 96 people, which is 95% of the total. However, there were the following issues and points to note with the survey, and these became lessons for the next time when conducting the survey.

- There were several respondents who were unable to access the Internet and therefore unable to respond.
- There were several respondents who did not understand English in most of the units of Farm/Unit Division. They responded mainly via mobile phone with the support of their colleagues and superiors. The original conditions for responding to the corporate diagnosis were (1) to respond based on one's own judgement even if one did not understand the content of the questions, and (2) not to be influenced by others.
- If a supervisor or colleague translates the answers and assists the respondent, the workplace environment and consideration for the supervisor will be added, and this will affect the evaluation of vitality level and leadership. This phenomenon was also seen in this survey.
- There is a possibility that the survey results will be used for individual evaluation in some way. It is possible to identify individuals in terms of vitality level evaluation by 'Unit' or 'Job Category' and 'Leadership' evaluation in each field, so sufficient consideration is needed when using the results.

3.1.4 The Result of Corporate Diagnosis

The findings of the corporate diagnosis survey cover five results where issues were identified within the organization. For perspectives not listed here, it can be assumed that the issues have not been identified by classification.

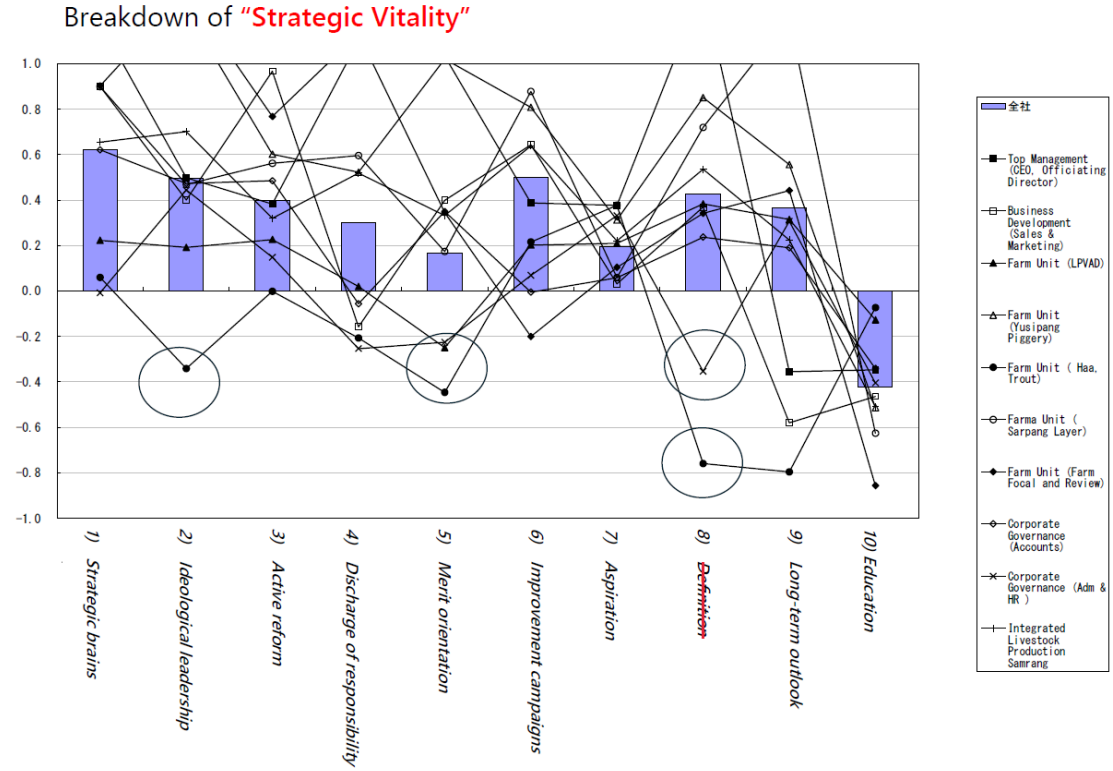
(1) Strategic Vitality by Unit



Number of valid samples	Belonging Unit
96	全社
2	Top Management (CEO, Officiating Director)
5	Business Development (Sales & Marketing)
19	Farm Unit (LPVAD)
7	Farm Unit (Yusipang Piggery)
4	Farm Unit (Haa, Trout)
20	Farma Unit (Sarpang Layer)
1	Farm Unit (Farm Focal and Review)
4	Corporate Governance (Accounts)
8	Corporate Governance (Adm & HR)
1	Corporate Governance (IT & Procurement, Security, Investment Review)
25	Integrated Livestock Production Samrang

Source: Corporate Diagnosis Survey at BLDCL

Figure 3-2 The overall result of BLDCL



Source: Corporate Diagnosis Survey at BLDCL

Figure 3-3 Organization Strategic Vitality of BLDCL

＜Result of Analysis＞

Figure 3-2 shows the overall result of BLDCL. Overall, employees at BLDCL are highly business-minded, and under the strong initiative of the CEO, employees are well organized (a characteristic of Kintaro Candy). Some employees feel that the atmosphere is a little less open than others. In other words, if the right business direction is called for, BLDCL can allow all employees to work together as one.

Source: JICA Survey Team

Figure 3-4 Image of Kintaro Candy

There are two implications of this result.

First. The level of strategic vitality is very high, because the current situation is analyzed that the Top Management is leading and uniting Employees into one. Therefore, there is a very strong desire among Employees to somehow improve the business.

Second. However, there are some cases where free communication and appropriate rules are not respected in the management process.

Table 3-5 shows the strategic vitality of all BLDCL and its units. The following are notable points. Overall, there is a wide variation by Unit, but here JICA Survey Team focuses on indicators that are far below the BLDCL average (bars) and the Units associated with them; notable items are as follows (see Table3-5).

Table 3-5 Notable Point of Strategic Vitality (Overall BLDCL and its composed Unit)

Degree of Strategic Vitality	Notable Point
1) Strategic brains	N/A
2) Ideological leadership	The low indicator means that an environment has been formed that is somehow contrary to BLDCL's management policy or Top Management approach. Haa Trout Farm has some kind of problem as its indicator is negative opposite to the other Units.
3) Active reform	N/A
4) Discharge of responsibility	The low level of this indicator indicates that an environment for the execution of responsibilities (i.e., lack of leadership) has not been created within Unit, and in the case of BLDCL, this is particularly problematic in the administrative divisions (general affairs, accounting, and human resources).
5) Merit orientation	Employees in LPVAD, HR, and HAA Trout Farm feel that there has not formed an environment that rewards the competent.
6) Improvement campaigns	The BLDCL average is relatively high, creating an environment that is receptive to Kaizen.
7) Aspiration	N/A
8) Definition	Low scores on this indicator indicate that the Unit still does not understand how to do its work (e.g., does not have a work guideline). Haa and Administrative Units fall into this category.
9) Long-term outlook	Work pressure often lowers this indicator; many people in Top Management, Sales & Marketing, and Haa workplaces are under this category.
10) Education	NA

Source: Corporate Diagnosis at BLDCL

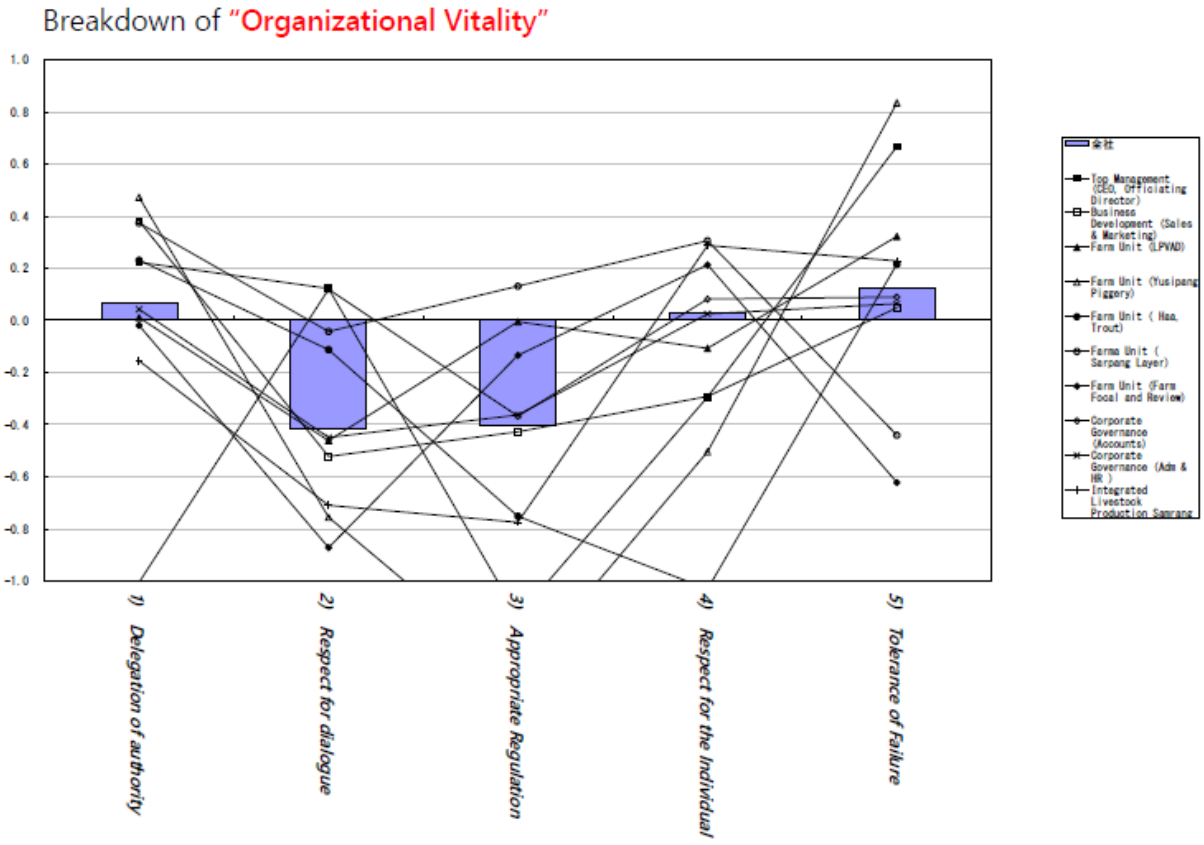
(2) Organizational Vitality by Unit

Organizational Vitality is an indicator of the degree of open communication within the organization. BLDCL is an organization in which the entire vitality belongs to Kintaro Candy and is managed by the strong leadership of Top Management. For this reason, Organizational Vitality is slightly low, and it is thought that there are some staff who feel a little stifled.

＜Result of Analysis＞

Figure 3-5 indicates that the level of open communication throughout BLDCL is in a somewhat tight environment. This is also a characteristic of companies in the Kintaro Candy domain. Among these, Sarpang and the back support units of head office have achieved relatively open communication. On the other hand, the environment of other units is more business-oriented than free communication.

The level of Organizational Vitality in each unit differs greatly, suggesting that the level of communication varies greatly from unit to unit.



Source: Corporate Diagnosis Survey at BLDCL

Figure 3-5 Organization Strategic Vitality by Unit

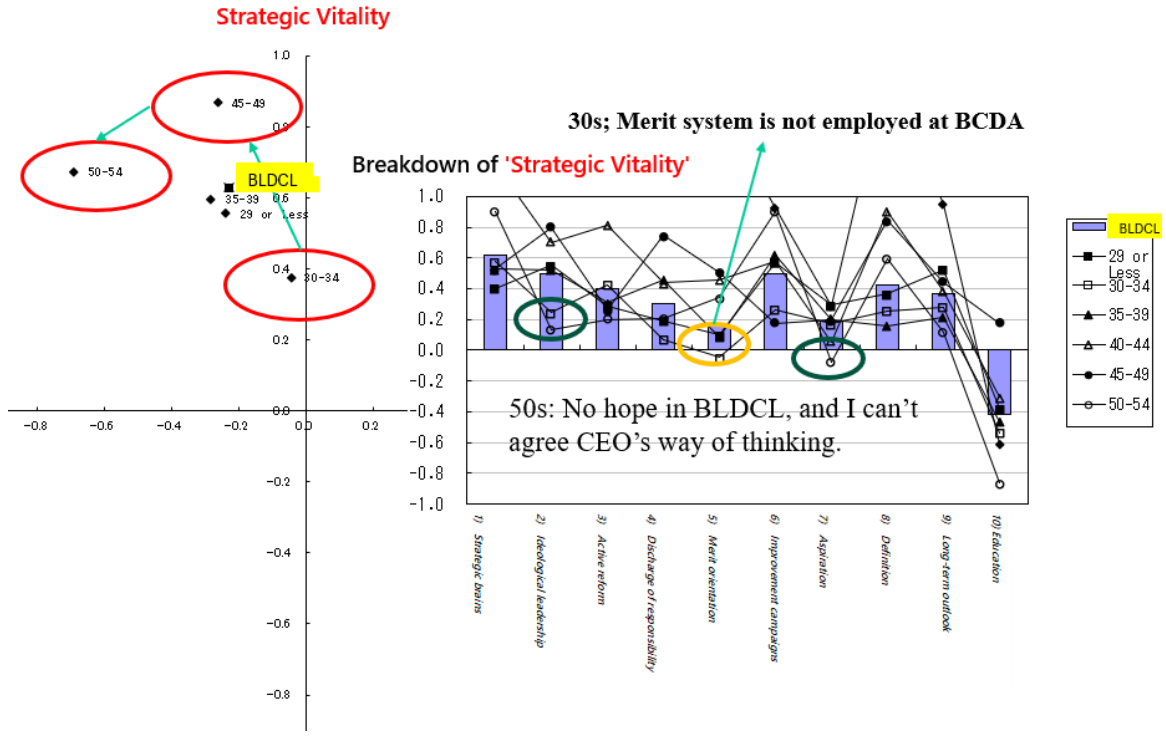
Also the following can be analyzed from Figure 3-5 (see Table 3-6).

Table 3-6 Notable Point of Organizational Vitality (Overall BLDCL and its composed Unit)

Degree of Organizational Vitality	Notable Point
1) Delegation of authority	Top Management feels that 'Delegation of Authority' is not being carried out, and it can be read that there is a conflict with the higher-level organization, and that they think they are unable to manage BLDCL as they wish.
2) Respect for dialogue	Most units have a low 'Respect for dialogue' indicator, and feel that it is a top-down environment.
3) Appropriate Regulation	Most employees feel that the internal rules are unclear.
4) Respect for the individual	In particular, in workplaces where the level of 'Respect for the Individual' is low (LPVAD, Yushipang, Haa), an environment has been created where management policy is respected over individual opinions.
5) Tolerance of Failure	In Sarpang and the head office administration unit, the indicator for 'Tolerance of Failure' is low, and there is a sense that failure is not tolerated.

Source: Corporate Diagnosis at BLDCL

(3) Strategic Vitality by Age



Source: Corporate Diagnosis Survey at BLDCL

Figure 3-6 Strategic Vitality by Age

The organizational activity of this generation is quite low, and it is thought that communication with other age groups is not smooth.

The following can be analyzed from Figure 3-6 as well (see Table 3-7).

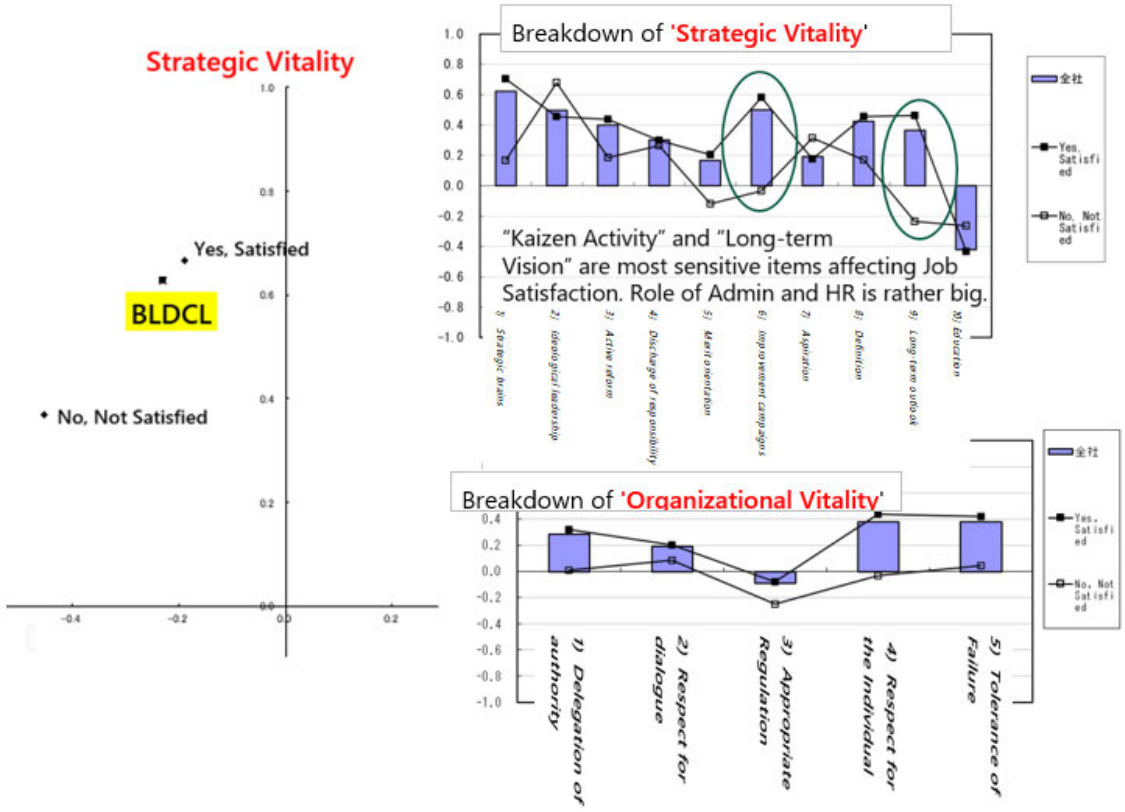
Table 3-7 Notable Point of Strategic Vitality

Degree of Strategic Vitality	Notable Point
1) Strategic brains	Older age groups understand their own missions better.
2) Ideological leadership	Younger 30-34 year olds and older 50-54 year olds do not have a favorable view toward BLDCL's management policies.
3) Active reform	40-44 year olds are actively engaged in their work.
4) Discharge of responsibility	It appears that the 45-49 age group is following a high level of responsibility execution (a generation with many leaders).
5) Merit orientation	BLDCL as a whole has a low level of this indicator, but there is a lot of dissatisfaction among the younger generation.
6) Improvement campaigns	Overall awareness of Kaizen activities is high in all generation.
7) Aspiration	The work environment makes it difficult to have expectations and dreams for the future.
8) Definition	The younger generation is in an environment where they are less confident about how to implement their work.
9) Long-term outlook	All generations have nearly identical long-term orientation.
10) Education	The majority of the generation, with the exception of the 45-49 age group of leaders, considers inadequate of HR Department.

Source: Corporate Diagnosis at BLDCL

(4) Strategic Vitality by Job Satisfactory

Of the 95 valid responses, 63 were satisfied with their current job and 32 were dissatisfied. The level of vitality of the satisfied respondents exceeded that of the dissatisfied respondents in terms of both 'Strategic and Organizational Vitality'.



Source: Corporate Diagnosis Survey at BLDCL

Figure 3-7 Strategic Vitality by Job Satisfactory

＜Result of Analysis＞

Figure 3-7 shows the level of strategic and organizational vitalities of those who are "Satisfied" and "Dissatisfied" with their current work collectively.

Regarding ‘Strategic Vitality’, the score associated with ‘Satisfied’ is high for seven out of the ten indicators. There is a large gap in the indicators related to the environment for accepting Kaizen, such as ‘Improvement campaign’ and ‘Long-term outlook’. In other words, ‘Dissatisfied’ person is not in favor of accepting Kaizen (‘Improvement campaign’) and implementing job improvements at BLDCL from a long-term perspective (‘Long-term outlook’).

The fact that the ‘Strategic Brain’ and ‘Definition’ indicators for ‘Dissatisfied’ are lower than for ‘Satisfied’ suggests that the latter do not fully understand 'What' and 'How' they should be doing.

The level of ‘Organizational Vitality’, which indicates the degree of open communication in BLDCL, is also clearly higher for ‘Satisfied’. The level of ‘Satisfied’ exceeds that of ‘Dissatisfied’ in all five indicators.

3.1.5 Utilization of the Survey Results

(1) Key points of the results on the ‘Corporate Diagnosis' at BLDCL

The following were the main points reported to BLDCL from the analysis of the corporate diagnosis conducted in this survey.

① Overall, employees at BLDCL are highly business-minded, and under the strong initiative of the CEO, employees are well organized (a characteristic of Kintaro Candy). Some employees feel that the atmosphere is a little less open than others.

② In other words, if the right business direction is called for, BLDCL can allow all employees to work together as one.

③ However, at the current stage, the leaders of the sections in charge of unprofitable businesses are losing their business-related vitality (Strategic Vitality is low at them), and the following items need to be considered to revitalize such leaders.

- Incentives based on performance
- Clarification of their career path and goal setting
- Replacement of leaders

(2) The benefits of using Corporate Diagnosis in conjunction with Kaizen project

In this survey, JICA Survey Team used corporate diagnosis in conjunction with Kaizen practices to examine their benefits. After examining the benefits, JICA Survey Team establishes JICA's protocol for reforming SOEs in Bhutan.

First, regarding the use of corporate diagnosis in conjunction with Kaizen practices, the following benefits were examined.

① In order for Kaizen activities to be effective, it is necessary to foster a sense of participation among all employees, under the initiative of the organization's top management. In this case, the implementation of the corporate diagnosis was handled by the General Affairs/Human Resources Unit, which had no direct involvement in the Kaizen activities. As a result, all the BLDCL's Units were involved in some way with JICA's Kaizen project (a part of the reform of SOEs), and the sense of participation among all BLDCL employees was raised.

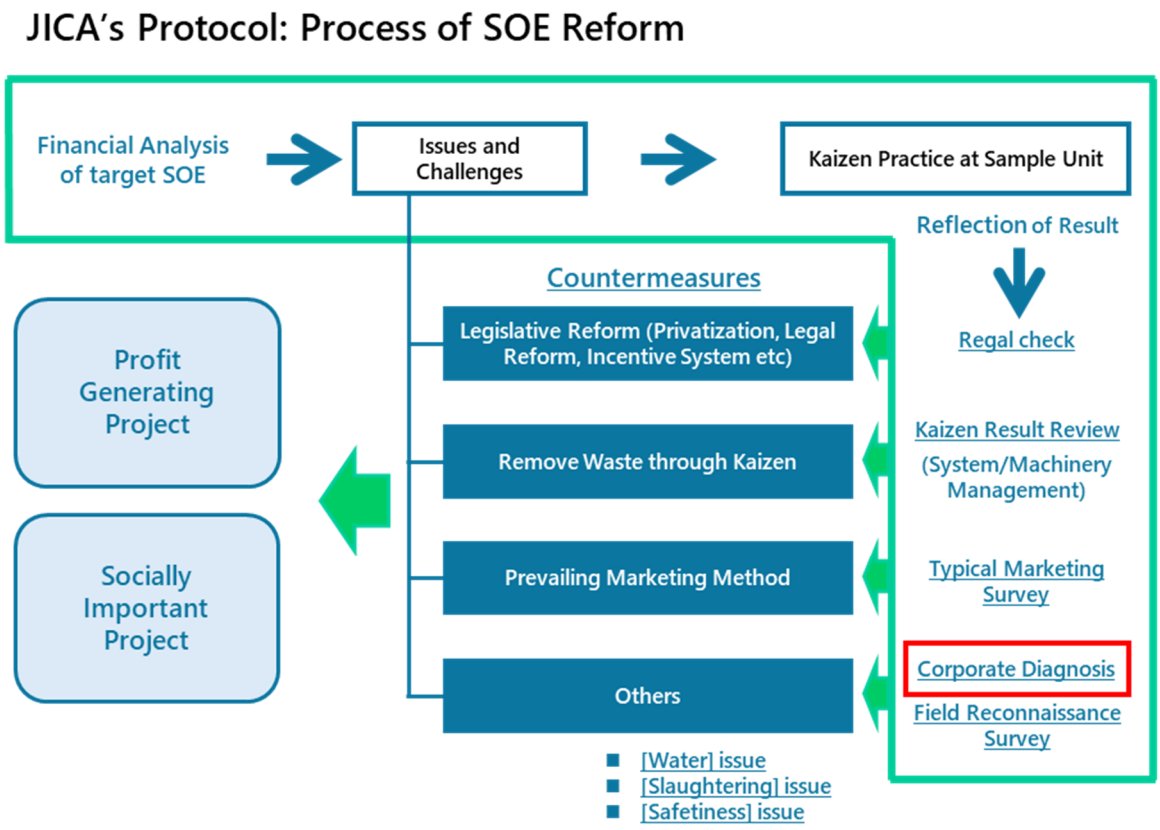
② The level of receptiveness of the target organization to Kaizen activities can be visualized using several indicators of ‘Strategic Vitality’ (viz. ‘Improvement campaign’ and ‘Active reform’). If these indicators are high, the organization in question is likely to be receptive to Kaizen activities.

③ Kaizen activities are one means of reforming SOE, and in addition to this, various other business improvements and the human resource development that goes with them are necessary. The

implementation of the corporate diagnosis made it possible to identify the business improvements needed in addition to Kaizen.

④ The corporate diagnosis was able to focus on the distinctive issues of the target SOE because the angle of analysis could be freely designed. In the case of BLDCL, it was possible to set up 10 original angles of analysis, such as by age or by level of satisfaction with current work.

⑤ JICA Survey Team was able to incorporate the corporate diagnosis as one process in JICA's protocol for supporting the reform of SOEs in Bhutan (see the diagram below).



Source: JICA Survey Team

Figure 3-8 Process of SOE Reform

This has enabled JICA Survey Team to make more comprehensive and in-depth recommendations for the reform of SOE.

(3) Trust and creation – the keys to successful cultural reform

Putting companies into the shape described above is easier said than done. The keys are mutual trust and management for creation based on that trust.

It is human nature not to want to do things that are out of touch with one's own wants or needs. In other words, if a change is to be successful, the top management level must desire it themselves. Since a company is an aggregate of individuals, even if some of these individuals want to change it and deploy measures they deem best to this end, the effort is bound to falter without the support of the majority. But, by the same token, it may take too long to build support among a majority, and this often prompts the people with power to promote changes in a rather unilateral fashion. This is the importance of leadership at the top in the process of reform.

The crux is therefore the extent to which those in the position to exercise such leadership enjoy the trust of the majority. Leaders who are not trusted cannot win the hearts of their charges and are apt to receive inaccurate information about the real state of things. And if they try to force the issue, they will be followed only grudgingly by their subordinates, whose morale will gradually fade.

Similarly, systemic reform concerned with the organizational setup, business process, or personnel arrangements often devolves into a means of only superficial vitalization. In such cases, the systemic reform usually comes to an end and can even have uncreative, unconstructive consequences.

These considerations point to a need for competent leadership that is trusted by employees, induces a full demonstration of individual talents and capabilities, and channels the same into creative team activities. Organizations and systems should be viewed as the infrastructure for discharge of the function of promoting such action.

APPENDIX 4 TECHNICAL ISSUES OF BLDCL

4.1 Technical Issues of BLDCL

4.1.1 Issues of Livestock Sector

(1) Findings from BLDCL Farm Survey (Yusipang Piggery Farm and Relangthang Layer Farm)

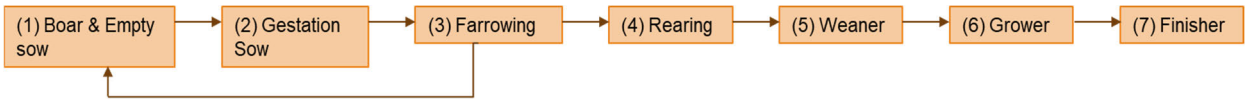
1) Well-planned production cycle and weekly supply of pigs

① Yusipang piggery farm follows MOF review suggestion

Capacity of sow is 100 for the farm. Tentatively, the farm keeps 53 sows and 18 gilts. To achieve 100 piglets per month (or 1,400 piglets per year), needs to achieve 70 sow production level and soon achieve. In terms of financial, performance is good.

⇒Once a new piggery farm is established in "Shomphangkha farm", Yusipang piggery may focus on piglet production and supply piglet to the new farm and Samrang. Yusipang piggery has advantage of location which is near to Department of Livestock (DOL) piggery breeding center.

② Proper cycle of pig production



Source: JICA Study Team

Figure 4-1 Proper cycle of pig production

⇒Procedure practiced in Yusipang Piggery should be documented by paper and captured by video (like castration and support of delivery, etc.), then shared to other farms. DOL also publicized "Pig and Poultry and Extension Manuals".

Inauguration of Pig and Poultry Production and Extension Manuals – DOL

⇒In the future, Yusipang has small R&D system to try new practices like feed (bio supplement feed), litter, etc.

2) Strict prevention measure for diseases control

Strictly follows direction from DOL about enhancement of farm biosecurity

⇒This level of biosecurity should be kept even after African Swine Fever is controlled. Same procedure should be applied to piggery farm in Samrang and Relangthang layer farm in near future

.

Yusipang Piggery Farm

Piglet in Brooder box

Heat Supplementation is given through bulb

2

Reference from Japan (Tips for Kaizen Activity in Yusipang Piggery Farm)

Example of monitor system
Even if visitors are not allowed to enter the farm, they can still monitor inside the activities. Only farm staff is allowed to enter the farm.
https://news.mynavi.jp/article/20191113-919989/
https://alpha-biz.com/work/id-5071/

Example of bio security
Complete cleaning of boots and work clothes
http://jlta.lin.gr.jp/report/animalwelfare/R02/pamphlets_AW_pig_202103R2.pdf
https://beppu-shoukai.com/kanoya-chikusan.html

3

Reference from Japan (Tips for Kaizen Activity in Yusipang Piggery Farm)

Example of Individual management card
Each sow has an individual management card like "chart". It has information on vaccine record, mating date & boar, expected delivery date, health condition, record of previous delivery and number of piglets, etc.
http://www.ebarayohton.co.jp/torikumi2.htm

Example of production management card
Piglet information is summarized as one group.
http://www.ebarayohton.co.jp/torikumi2.htm

4

Reference from Japan (Tips for Kaizen Activity in Yusipang Piggery Farm)

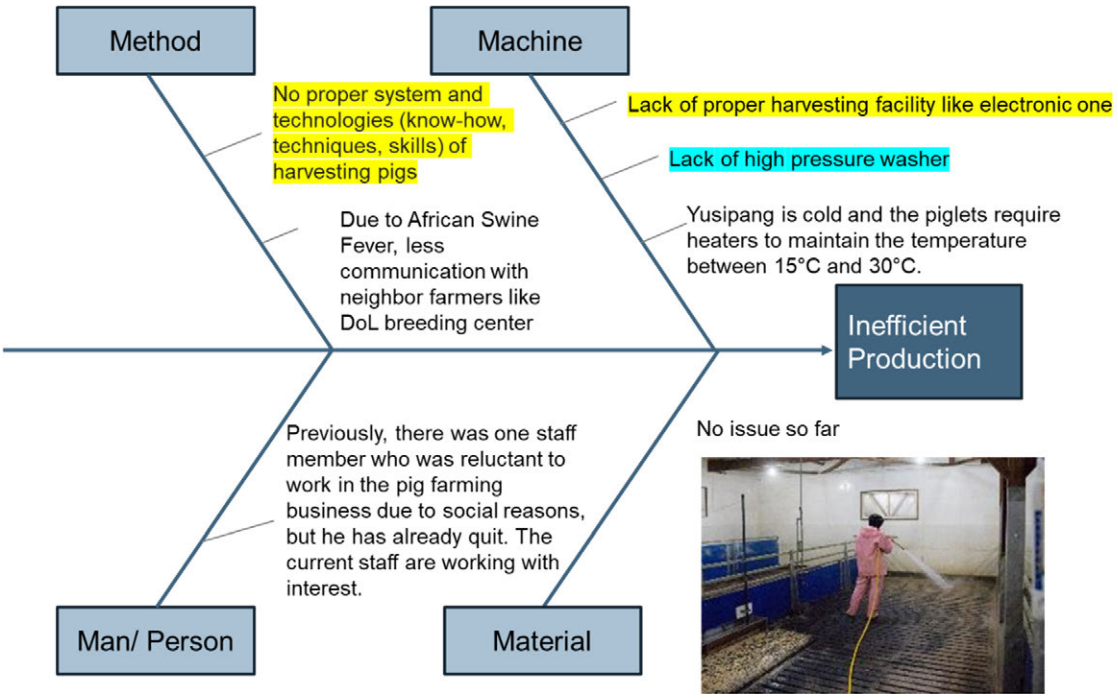
Proper handling of pigs following Animal welfare
Following the idea of animal welfare reduce the stress of pigs and diseases, leading to good production
http://jlta.lin.gr.jp/report/animalwelfare/R02/pamphlets_AW_pig_202103R2.pdf

Example of Heat measure
Cooling pad and Covering material that blocks summer sunlight

Example of cold measure
Colts heater and floor heating

5

Fish bone diagram of Yusipang piggery farm. Most critical challenge is "Lack of an appropriate harvesting system based on animal welfare and food safety"



Source: JICA Survey Team

Figure 4-2 Challenges in Relangthang Layer Farm and Their Factors

(2) Suggestion for Yusipang Piggery

- **Needs appropriate harvesting system based on animal welfare and food safety**
  - ➢ Working with cultural barriers

  BLDCL needs assessing current needs and capacity of the facility if deciding to install the system. In addition to BLDCL farm, introduction of proper harvesting system or practice is necessary for local farmers since they bring their pork to LPVAD. Together with LPVAD and Yusipang piggery needs a further plan.

- **Prepare technical manuals and SOP**
  - ➢ "Yusipang piggery model" should be applied to other farms

- **Kaizen Activities**

  Pigs and chickens are being Harvested out of public sight (unmonitored), highlighting the need for the nationwide introduction of appropriate harvest systems based on food safety and animal welfare. Within BLDCL, there are considerations to construct a pig harvest facility, but discussions with the government have yet to yield any concrete progress.

  The lack of a proper harvest system could prevent the full effectiveness of Kaizen initiatives. In such a challenging situation, LPVAD, which processes pork, has started feasible initiatives such as providing guidance to farmers.

- **Marketing**

  Bhutan has a certain level of demand for pork, and currently, it faces no significant marketing challenges. Previously, LPVAD faced issues such as a shortage of pork and poor quality of harvested pork. However, these issues have improved following the implementation of Kaizen activities.

- **Other**

  Young managers are actively working to improve the pig farming business, which is one of the promising and profitable ventures within BLDCL. It is also expected to be applied to the Samrang Farm. The survey team has proposed the preparation of technical manuals and SOPs.

4.1.2 Findings from Relangthang Layer farm

(1) Technically well managed by farm manager & staff

1) Increasing stocks from MOF review: 6,295 (July 2023) ⇒ 22,806 birds (February 2024)

Although performance of layers should be assessed after most of birds start laying, the skillful farm manager supervises the farm and farm assistant follow this direction and technically well managed. In terms of financial, performance is good.

⇒Procedure practiced in Relangthang farm should be documented by paper and captured by video, then shared to other farms. DOL also publicized "Pig and Poultry and Extension Manuals".

Inauguration of Pig and Poultry Production and Extension Manuals – DOL

Besides, "Hy-line international" published Hy-line brown online management guides and performance summary (indicators)[1].

⇒In the future, Relangthang has small R&D system to try new practices like feed (bio supplement feed), litter, etc.

Use of 6 sheds at Turkey Farm for layer production

In terms of ease of procurement of Day Old Chicks (DOC) and feed and marketing of products, keeping layers is good. Need to assess the performance.

Source: JICA Survey Team

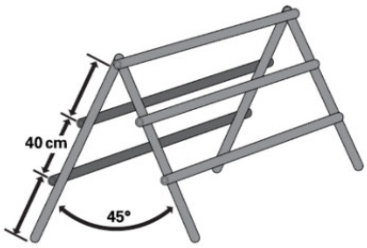
Figure 4-3 Poultry farm in Relangthang. Equipment is properly arranged by the farm

[1] hyline.com/literature/brown

Source: JICA Survey Team

Figure 4-4 Relangthang Layer farm

2) Reference from Japan (Tips for Kaizen Activity in Relangthang Layer farm)



	Size of perch (cm/bird)
Up to 17 weeks	5 to 15cm
From 18 weeks	10 to 15cm

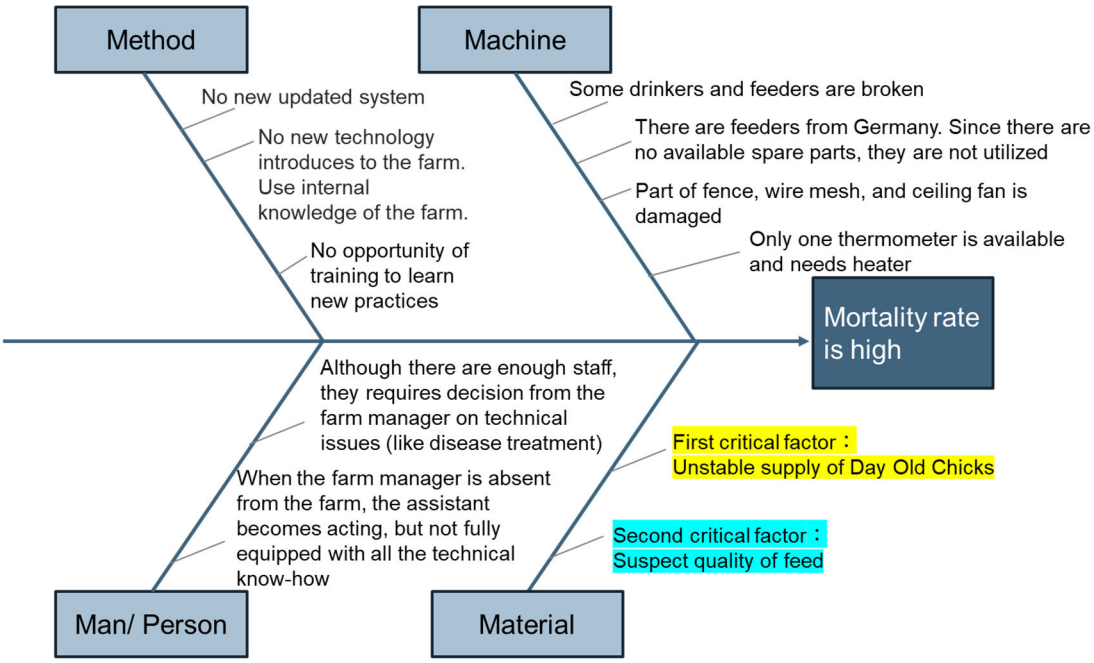
Example of rice husk bedding
https://www.akanefarm.com/blog/archives/1199

In case of deep litter system, perching is recommended in addition to proper stocking density. Following animal welfare practice reduce stress of poultry
https://www.ghen.co.jp/pdf/04-borisbrown.pdf

Source: JICA Survey Team

Figure 4-5 Example of purchasing

Fish bone diagram of Relangthang Layer Farm. Most critical challenge is related to input supply.



Source: JICA Survey Team

Figure 4-6 Challenges in Relangthang Layer Farm and Their Factors

(2) Suggestion for Relangthang Layer farm

- **Needs procurement plan of DOC for late 2024 and 2025**
  - BLDCL prepares the plan and share it with the government farm (National Poultry Development Center)

  Based on discussion with "Sales & Dealership" and "Marketing & Research", make a plan for selling eggs and prepare procurement plan for next year. The plan should be market oriented.

  Tentatively, size of layer batch (number of layers) and cycle are not standardized. Therefore, the supply of eggs may be not stable for customers.

- **Prepare technical manuals and SOP**
  - Diagnosis of common diseases

  Diagnosis of common disease should be documented or captured by video and shared among farm assistants. Special treatment like debeaking, vaccination, medication etc. should be done too. The manual and SOP can be shared with Sarpang farm, new farm and contract farmers in the future.

- **Needs trial of new feed at small scale (e.g. one shed only) if necessary**
- **Marketing**

  The Livestock Department supplies DOC, but the supply volume is inconsistent, resulting in unstable egg production. Eggs also tend to drop in price during summer. It is necessary to secure stable supply destinations and establish a procurement plan for DOC.

- **Other**

  The manager possesses high technical skills, but there are cases where other staff face difficulties making decisions in the manager's absence. It is proposed to prepare technical manuals and SOPs (Standard Operating Procedures) to share the manager's expertise within

and outside the farm. If necessary, it is also suggested to conduct small-scale trials (e.g., within a single section) to test new feed.

4.1.3 Issues in trout aquaculture department

(1) Basic information about the Haa Trout Farm

1) Farm facilities and history

The trout aquaculture operations are conducted by the BLDCL, using the facilities of 10 new fish ponds (total capacity of 4,400 m^3) that were built around 2013 to 2015 and transferred to the BLDCL as well as part of the National Research and Development Center for Riverine & Lake Fisheries (NRCR&LF) site in Haa District, DOL, Ministry of Agriculture and Livestock (MOAL).

The history of trout farming in the area dates back to the 1960s, when the first ponds were built and farming began, and since then the facilities have been expanded as needed. The current NACR&LF was established in 2005 and employs 30 full-time staff. In comparison, the BLDCL farm has 4 staff.

Source: JICA Survey Team

Figure 4-7 Overall of NRCR&LF
(Photo taken around 2015, from the NRCR&LF website)

The management area is divided into areas; BLDCL facilities in the yellow line box and others with DOL (NRCR&LF) site facilities. The ponds are arranged vertically in rows from the upstream, with the intake of river water flowing from upstream to downstream and with a drop-off between ponds to prevent a shortage of dissolved oxygen. 10 BLDCL aquaculture ponds are numbered from ① to ⑥, A, B, C, and BP from upstream. As shown in the table, the ponds have a total volume of 4,400 tons.

Table 4-1 Number of pond and volume of BLDCL Ha farm

Pond No.	Length (m)	Width (m)	Depth (m)	Volume (㎥)
①	63.0	7.3	1.3	595
②	68.5	7.3	1.3	647
③	22.3	7.3	1.3	210
④	30.6	7.3	1.3	289
⑤	26.4	7.3	1.3	249
⑥	26.6	7.3	1.3	251
BP	41.9	24.9	1.3	1,355
A	37.2	5.8	1.3	280
B	38.0	5.4	1.3	267
C	37.7	5.4	1.3	265
Total				4,407

Source: JICA Survey Team

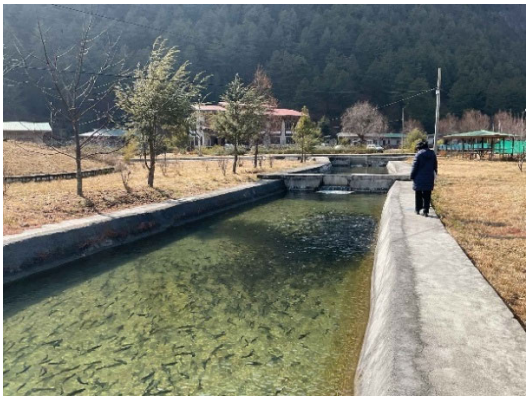
2) Irrigation water

The entire NRCR&LF and BLDCL fish farms have two water intake systems. (A) water drawn from rivers and the other is (B) spring water from the mountains. (A) water is used in BLDCL fish ponds.

① River water

The stored clean surface water that flows into the weir in front of the inlet is piped and supplied to the BLDCL aquaculture ponds. The water taken from the river is not filtered or sterilized, but there is a litter fence at the inlet to remove matters such as rubbish (but very little amount) and driftwood. In winter, when the river water volume is reduced and there is not enough water flowing into the weir, dredging is carried out as necessary to control the flow of sufficient water and the water intake is stable throughout the year at around 250 liters/second. Data loggers are installed in the fish ponds (1 pond, No.2 in BLDCL) so that water temperature data can be recorded at all times. Other water quality parameters are measured manually, such as dissolved oxygen amount. The river is separated from the fish ponds and farm site by a dike to prevent water from flowing into the aquaculture farm when the water volume increases due to heavy rainfall during the summer months, so there is no possibility of risk by flooding. The river water temperature fluctuates widely throughout the year, ranging from 1 to 20°C (monthly average: 4 to 15°C), and especially in winter (November to February), the rearing pond water temperature drops under 5°C, leading to low feeding rates and low growth of the rearing fish. According to the farm manager, around 2015, the river water never reached above 15°C, but the water temperature has been gradually increasing over the last few years, possibly due to the effects of global warming.

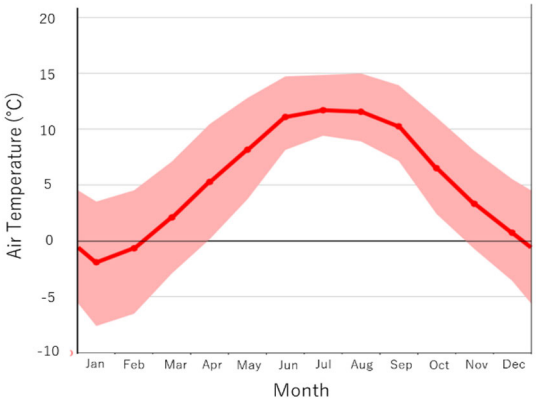
Upper-most pond①



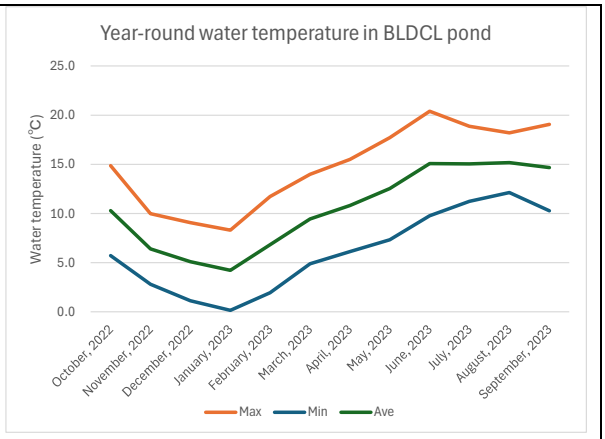
Young fish being reared in the flowing pond③

Source: JICA Survey Team

Figure 4-8 BLDCL's fish farm



Annual temperature in Haa Prefecture
(Source: https://en.climate-data.org/)



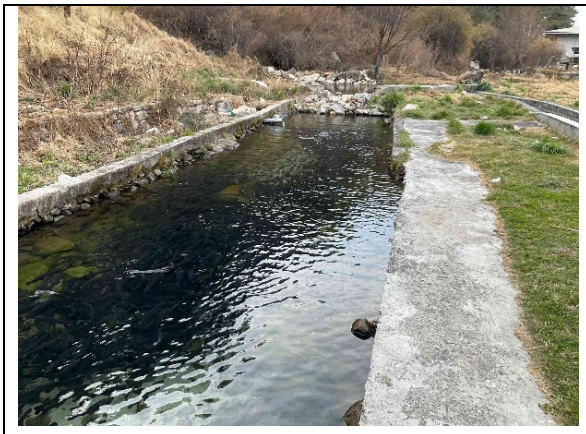
Measured water temperature in BLDCL fish ponds
(October 2022 - September 2023)

Source: JICA Survey Team

Figure 4-9 Annual temperature in Haa Prefecture and water temperature in BLDCL fish ponds

② Spring water

At NRCR&LF, there are springs that gush out from multiple locations on the mountain side, and although the water volume decreases slightly in winter, there is a plentiful supply of water throughout the year. The water temperature is stable throughout the year, ranging from 10 to 13℃, and the spring water is used in the hatching facility, the pond for rearing fry, the pond for aquaculture (for rearing adult and parent fish), and the sturgeon rearing pond that was introduced in recent years.



NRCR&LF adult fish rearing pond
The back (upstream) is a spring water area. Adult rainbow trout (over 300g) are reared here, including potential parents.

NRCR&LF fry and juvenile rearing pond
Weighing and counting of one-year-old fish (around 100g) is being carried out.

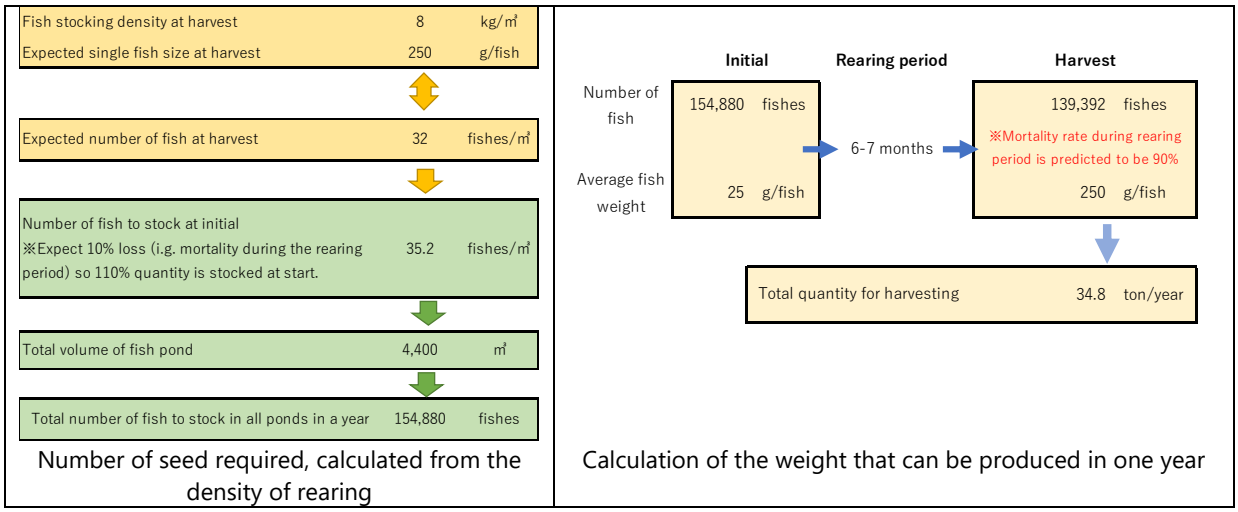
Source: JICA Survey Team

Figure 4-10 NRCR&LF fish ponds

3) Aquaculture production and sales

① Production plan

The BLDCL plan aims to produce 30 tons of adult fish by rearing about150,000 fry (25g/fish) per year. This is based and calculated on average fish weight of 250g/fish at harvest time, a rearing density of 8kg/m^3, and the total volume of the pond (4,400m^3).



Source: JICA Survey Team

Figure 4-11 Example of production simulation

BLDCL purchased rainbow trout fry (25g size, 4 to 5 months after hatching) from NRCR&LF at a rate of Nu.14 /fish. After that, they plan to ship them in order of size, starting with those that have grown to over 250g after 6 to 7 months. However, in 2023 to 2024, they have not shown the growth that was planned. In addition, as shown in the box below, in order to continue the planned harvest and shipment of 3 tons per month at BLDCL, it is necessary to adjust the timing of stocking seeds to match shipment period, but in reality, there is a lack of perspective on the timing of stocking, feeding plans and growth forecasts, and it is not planned aquaculture production.

Box 1 BLDCL shipping plan

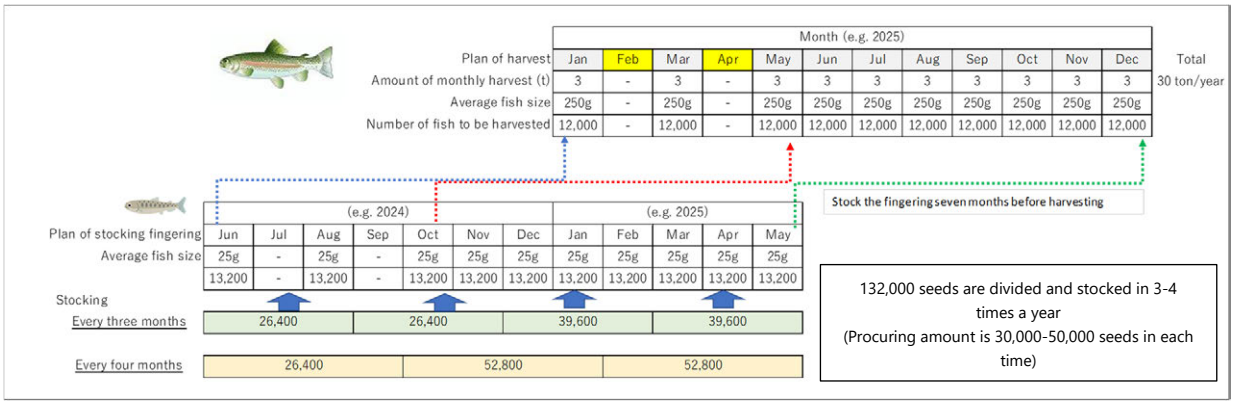
The Haa fish farm of BLDCL has a production potential of about 34 to 35 tons of rainbow trout per year, based on the pond volume.

↓

The target for shipping rainbow trout is set at 3 tons per month, and excluding the meatless month (Note 1), a production and shipping plan of 30 tons per year is planned, with 3 tons x 10 months

(Note 1) In Bhutan, the sale of meat (including fish) is prohibited for religious reasons in February and April, so shipments are completely suspended for those two months. In addition, the sale and shipment of meat is prohibited for three days each month (8th, 15th and 30th).

In order to achieve the target of 3 tons of fish being shipped each month, it is necessary to stock seeds 7 months before the harvest month in order to ensure a stable harvest each month. It is necessary to continue stocking seed and culture in anticipation of future shipping periods and demand. For example, if 3 tons of fish are to be supplied from the farm each month, then a production plan is needed that involves stocking 30,000 to 40,000 fish every 3 to 4 months. However, as mentioned above, in reality, during the period when the water temperature drops, feeding activity decreases and growth slows, so it seems necessary to review the initial plan's 7-month rearing period, the timing of stocking the seedling ponds, and the size of the fish to be released (currently 25g/fish).



Source: JICA Survey Team

Figure 4-12 Month and number of fish released, calculated from the month of harvest

② Shipping sales and supply chain

The LPVAD in Thimphu has set a target of 1.5 tons of rainbow trout per month. In other words, half of the 3 tons of rainbow trout that the Haa fish farm of BLDCL aims to produce each month will be shipped to the LPVAD. The rainbow trout that is received at the LPVAD is processed as processed meat, frozen after GG treatment, and then sold to dealers. Meanwhile, the remaining 1.5 tons is sold to external parties (dealers, etc.) via other routes through the Sales and Dealership division (SDD) of BLDCL as fresh fish. There are currently 10 to 11 food dealers in Bhutan that handle fresh meat and fish (1 in Paro, 1 in Bumthang, 1 in Mongar, 1 in Samdrup Jongkhar, and the rest in Thimphu), and 7 of these dealers sell fresh meat and fish from their base in Thimphu. BLDCL (LPVAD and SDD) has an agreement with the Thimphu dealer on the purchase price, etc., and the product is sold to each dealer at the agreed price. After that, it is distributed to retailers and retail stores through the sales network of each dealer. The target shipment volume from Haa Farm is 3 tons per month (1.5 tons to LPVAD and 1.5 tons to dealers via SDD). However, on the other hand, it is said that Haa Farm is given instructions on the amount of fish to be harvested each time by LPVAD and SDD, while monitoring market trends (supply and demand) and inventory condition. In other words, demand throughout the year is not constant. If it is considering Haa Farm's aquaculture business (income and expenditure, profitability) on its own, it needs to make some kind of arrangement, such as including a minimum monthly purchase amount in the trading contract with the dealer.

③ Rainbow trout demand and trial production of processed products

Demand for fresh fish is higher than for frozen fish. The majority of orders come from hotels and restaurants, and according to the head of the livestock department at BLDCL, there is a demand for 600kg of fresh rainbow trout every 2 weeks. LPVAD once produced smoked (warm-smoked) rainbow trout products in order to diversify their rainbow trout products and increase their added value, but they were not sold well, so they have not continued with this. In addition, NRCR&LF once produced a trial batch of bottled rainbow trout eggs (Red Caviar) as a sample, but there are no plans to sell them to the public.

Frozen rainbow trout was sold in stores when BLDCL was developing its retail business, but because rainbow trout is an unfamiliar and expensive fish for Bhutanese people, many of the fish were unsold and became defective inventory. In BLDCL's retail business, the most unsold items were frozen rainbow trout and sausages, and these were written off as losses.

④ Shipping method

When the shipment, the order quantity from LPVAD or SDD (i.e. the shipment quantity from Haa fish farm) is communicated to the farm manager in advance and it prepares to harvest the fish reared at the farm. (In this case, if there is no stock of 250g or more, the fish will be purchased from NRCR&LF. The purchase price from NRCR&LF is Nu. 450 /kg)

After that, a truck (a container = a cool box with ice) arrives at Haa from LPVAD (Thimph), and rainbow trout taken from the ponds are loaded into the cool box and transported to Thimph LPVAD in the condition of being covered in ice. As there is only one 1.5-ton truck as described below, even if the amount transported on a given day is small (for example, a few hundred kilograms), a large 3-ton truck may be used, which can result in inefficient transport.

<Reference information> Vehicles (trucks) owned by BLDCL for transport

- 5-tonne...2
- 3-tonne... 3 (one of which is deployed in Samran)
- 1.5-tonne... 1

* 5 of the 6 vehicles owned are deployed in LPVAD, except for 1 in Samran.

In addition to the above, there are also customers who come to the Haa farm to buy the fish directly, and they also sell to them. The volume of sales is 50kg/month in the high season, and around 30kg/month on average. The selling price from the Haa farm to external customers is Nu. 490 /kg.

⑤ BLDCL production and shipping results

The Haa fish farm is reported to have produced 11 tons (2022) and 12.9 tons (2023), and to have made sales of Nu. 5.56 million (2022) and Nu.6.3 million (2023).

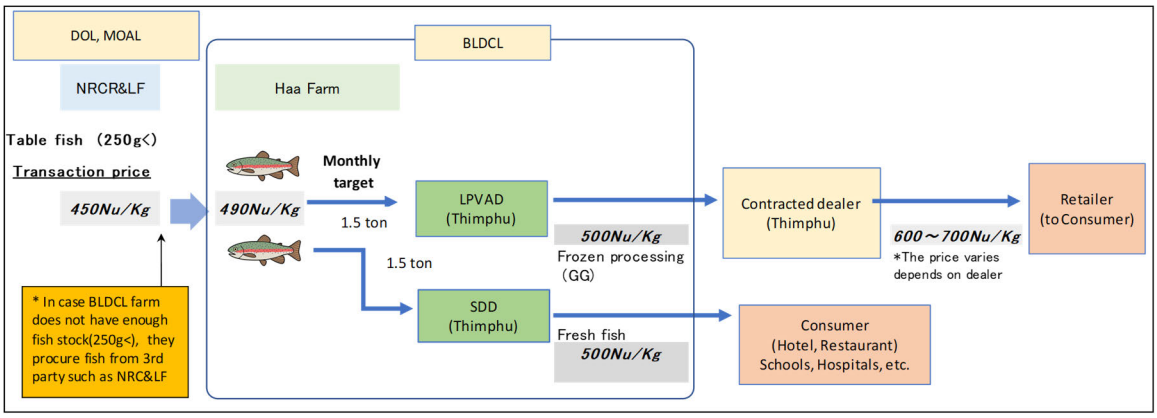
Table 4-2 Shipping and sales results for Haa fish farm

Year	Quantity (Meats Mts)	Revenue (Mil Nu.)	Average sales price per unit (Nu/kg)
2022	11.0	5.6	505
2023	12.9	6.3	488

Source: JICA Survey Team

⑥ NRCR&LF production

The NRCR&LF of the MOAL has also been given a quota for the production and sale of rainbow trout, and it is said that at least 10 tons, or Nu. 4.5 million., must be sold for the national treasury each year. (The unit price of adult fish is Nu. 450 /kg.) The annual production volume, etc., is not disclosed, so the actual figures are unknown.



Source: JICA Survey Team

Figure 4-13 Flow after harvest (NRCR&LF and Haa fish farm)

4) Feed security and feeding conditions

① Procurement feed

BLDCL had been using EP feed produced in Denmark (BioMar), but due to the global rise in the price of grain and other feed ingredients in response to the situation in Ukraine, the price of feed, which had previously been Nu. 167 / kg, rose significantly from 2023 onwards to Nu. 205 / kg. As a result, from 2023, the switch to cheaper EP feed produced by COPPENS in the Netherlands was promoted. Note that feed procurement is not carried out independently by BLDCL, but is a joint procurement with NRCR&LF, firstly procuring the necessary amount for BLDCL and then distributing it to BLDCL.

Table 4-3 Feed price

Denmark (Biomark) EP for trout	Nu. 167 / kg ＊2022-2023 Nu. 205 / kg ＊After 2023
Netherlands (COPPENS) EP for trout	Nu. 155 / kg
India (Growel) EP for carp feed	Nu. 148 / kg

Source: JICA Survey Team

② Feed type and feeding rate

For BLDCL, start rearing with 25g sized fry and feed them 2mm EP feed. After that, three different sizes (grain diameter: 2mm, 3mm, 4.5mm) are used depending on the growth stage. The number of fish in each pond and the size (weighing them once a month to keep track of their overall weight) are measured and it adjusts the amount of feed calculated by multiplying the feeding rate according to each growth stage. It calculates the feeding rate based on the instructions given by the feed manufacturer, but in winter it uses a uniform feeding rate of 1%.

③ Dealing with feed shortages

BLDCL farms have been on constant feed shortage since 2022 due to budget shortages, hampering feeding. In 2023, NADR&LF imported 28 tons of feed from Denmark. In 2023, BLDCL had no feed stocks at all and received some amount from NADR&LF, however, this was still insufficient to meet the requirement. The Danish feed was expected to achieve FCR = 1 and reach 250g size in 6 to 7 months, but due to feed shortages, it took 27 months to reach the target size and ship the fish.

As for the one-year-old fish currently being reared, 1 ton of carp feed made by India's Growel was imported as an emergency measure to deal with the feed shortage, and feeding has begun in combination with the existing imported feed. Growel feed is EP with a particle size of 3 mm, and the manufacturer states that the crude protein content is 28% and crude fat content is 4%, which is quite low, and the composition details such as the type of animal protein raw material and the fish meal content are unknown. It clearly does not meet the nutritional requirements of rainbow trout (generally around 40 to 50%).

According to the BLDCL Haa farm manager, some growth was observed for the Indian feed after several weeks of trial feeding, although no growth comparisons had been made with other feeds under the same conditions. However, since using the Indian feed, the mortality rate has increased from 1 to 2% in the past to about 10% (in some cases up to 100 fish per day). The number of individuals exhibiting water mold disease has increased, and the color of the harvested cultured fish is reported to be whitish and soft. There is a large difference between the ingredients of the two manufacturers' feeds, and if all feeds were switched to Growel's feed and feeding continued, growth and healthy development would likely be hindered. Even under these circumstances, imported feed takes approximately three months from order to arrival, so it is necessary to place orders in advance in anticipation of timing and demand while planning for future feeding, but as of February-March 2024, no orders had been placed due to budget shortages, so feed shortages are a constant state of affairs. In addition, the BLDCL Revival Plan proposed the use of waste from LPVADs as feed, but this has not yet been realized.


Carp feed manufactured by Growel, India
EP for 3 mm, crude protein content 28%, crude fat 4%.


EP for trout 4.5 mm from the Netherlands (COPPENS)
42% crude protein content, 20% crude fat

Source: JICA Survey Team

Figure 4-14 Feed in use

④ Feed management

Trout farming in the BLDCL feeds 3 times a day. During the winter, water temperatures drop to extremely low levels, around 1°C in the morning, and feeding activity drops. Feeding is carried out during the few hours in daytime when the water temperature rises, but little growth can be expected during this period. As there is a shortage of feed, 1% of the feed is fed uniformly in each pond, rather than the amount calculated from the feeding rate.

5) Eyed egg and fry production, parent strain and rearing management.

The rainbow trout currently reared in the NRCR&LF as well as the BLDCL originated in 2007 with the introduction of 20,000 eyed eggs from Jammu and Kashmir, India (Kokernag trout farm). This was followed by the introduction of eyed eggs from Himachal Pradesh, India (Indo-Norway Trout Fish Farm) in 2013 and from Gandaki, Nepal (Trishula Trout Farm) in 2015. In 2010, eyed eggs were imported from Denmark and are now rainbow trout inheriting these strains are crossbred and successively reared.

① Eyed eggs from Denmark

For the past few years, NRCR&LF has annually raised hatchlings from Danish (Troutex Aps) eyed eggs as cultured seeds. The eyed eggs hatch in about 1 month → larvae are reared in indoor hatching facilities for 1 to 1.5 months (5g size) → reared in outdoor rearing ponds for 1.5 to 2 months → 25 g size seeds are produced.

The price for 100,000 eyed eggs is Nu. 200,000 (this includes transport costs), i.e. Nu. 2 / egg. Importation of eyed eggs requires a certificate of disease-free (virus-free) from the originator or exporter. The certificate is submitted to the Bhutan Food and Drug Authority (hereafter BFDA) and only after approval the egg is allowed to enter the center (NRCR&LF). Danish eyed eggs are imported around November each year, but can be imported at any time of year if ordered. Most recently, the NRCR&LF imported 100,000 eggs in November 2023 for fry production in 2024. NRCR&LF's experience to date is that the hatching rate of Danish eye eggs is over 90% and the survival rate to seed is around 80%, so there are no particular problems.

In addition, the Troutex Aps website states that the company's eyed eggs have the following characteristics.

Eyed eggs from Troutex Aps, Denmark

(1) Characteristics

- Large egg diameter (5.3 to 4.8mm)
- Good growth (SGR) and feed efficiency (SFR・FCR)
- Egg sampling from five parental strain to avoid inbreeding depression.
- Various data on each individual is recorded and used to calculate breeding value. Only the best conditioned individuals are then used as parents.
- All eggs are disinfected 24 hours before shipment and packed in polystyrene boxes with ice and gel packs for shipment.

- Good yield rate for shipping size (viscera content is less than 14% of total)

(2) Disease resistance

Resistant to the following 10 fish diseases

- IHN (Infectious Haematopoietic Necrosis)
- VHS (Viral Haemorrhagic Septicaemia)
- EHN (Epizootic haematopoietic)
- SVC (Spring Viremia of Carp)
- IPN (Infectious Pancreatic Necrosis)
- ISA (Infectious Salmon Anaemia)
- BKD (Bacterial Kidney Disease)
- OMV(Oncorhynchus masu virus)
- Streptococcosis(Lactococcus garvieae)
- Ceratomyxa Shasta

(3) Certifications.

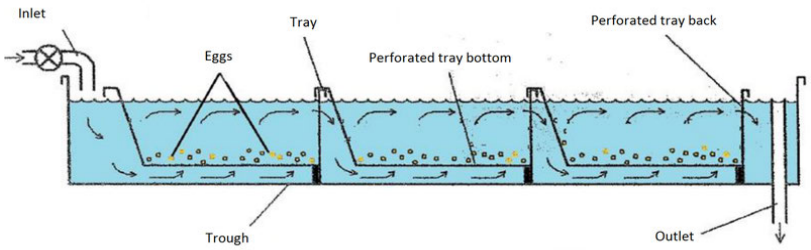
The following three international certifications have been obtained to guarantee product quality

NSF Certification	BUREAU VERITAS	GLOBAL G.A.P

② Hatching method (NRCR&LF)

No disinfection of eggs or drugging of fry is carried out. Metal hatching trays (vertical incubation tanks) containing eggs are placed vertically in rows in the tanks, with water flowing vertically and homogeneously between the eggs. Although the number of eggs that can be accommodated is not large, the advantages are that the larvae do not stick in one place in the tank and the dead eggs can be easily removed manually to prevent water mold.

Methods of setting up hatching trays



Hatching methods used in the NRCR&LF

Source: JICA Survey Team

Figure 4-15 Hatching methods

		
Rearing of fry (1-1.5 months) (eggs are from NRCR&LF, not from Denmark)	Danish eyed eggs hatched in December 2023 and grew to around 5g at the end of February 2024	Sorting in fry rearing pond (sorting and counting of fry >20g)

Source: JICA Survey Team

Figure 4-16 Rearing of fry

③ Local parent fish rearing and seeds production

At the NRCR&LF farm, well-grown individuals have been selected from 2 to 3-year-olds of the fish (successively reared stocks) and reared as parent fish, and egg production from the parent fish has already started. The most recent egg collection was carried out between November and December 2023, when the female parents were identified for maturity and the large fish were anesthetized several times with cloves to reduce damage caused by handling.

Source: JICA Survey Team

Figure 4-17 NRCR&LF Egg collection - sperm collection - fertilization from parent fish

Although the details of the superiority of Danish and local (Indian and Nepalese crosses that have been bred in succession) seeds are not yet clear, there are reports from production sites that when batches were reared for the same period under the same conditions, the average weight of Danish seeds was approximately 35g and that of local seeds was approximately 45g, so it has been suggested that local seeds may grow faster. NRCR&LF also continues to produce local seeds and may switch to domestic seeds in the future. In addition to being reared at (1) NRCR&LF farms, the fry produced at the NRCR&LF are supplied to (2) BLDCL farms and (3) private fish farms.

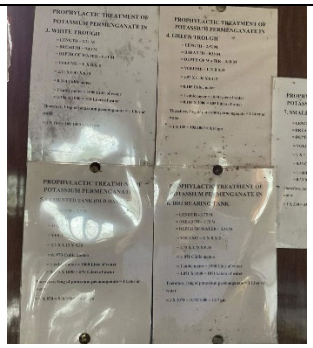
④ Quarantine measures for fish farms and hatcheries.

A step-in disinfection tank (potassium permanganate solution) at the entrance to the NRCR&LF hatchery provides primary quarantine measures to prevent horizontal infection. However, less attention is paid to hand disinfection, transfer of tools and equipment (buckets, nets, etc.) and transfer of fry and rearing fish between ponds, which is not sufficient to prevent the entry of external sources of infection. In Bhutan, there have been no outbreaks of fish diseases (viral or bacterial)

resulting in mass mortality, which may be related to the lack of awareness of fish disease preparedness.

For reference, the only fish diseases that have been confirmed to date are water-borne molds that occur during sudden changes in water temperature or after sorting (handling). Apart from the use of salt as a treatment, no other drugs (e.g. antibiotics) have been used. The farm is located in an isolated area, there are no farms in the same river basin (see note), and no external organisms (eggs, fry, adult parents, etc.) have been transferred in recent years other than Danish eye eggs, making it a potentially valuable virus-free aquaculture environment with very low potential for vertical and horizontal infection and trans-egg transmission.

However, a sturgeon rearing program by the DOL (NRCR&LF) is currently underway, with rare transfers of adults and juveniles from a branch site (sturgeon aquaculture center in Wandue Podrang province). There are also reportedly plans to bring in new juveniles from Thailand in the near future, so extreme caution should be exercised when transferring fish from external sources involving water transfers.



Potassium permanganate (made in India) and Table of adjusted concentrations for each disinfection tank and water tank on the walls in the hatchery

At the entrance to the hatchery Step-in disinfection tanks

Source: JICA Survey Team

Figure 4-18 Quarantine measures for fish farms and hatcheries

6) Other information

- Weasels sometimes invade and prey on fish. The number of incidents is not very high and only happens a few times a year, but the night watchman patrols the area and sometimes exterminates them when he finds them.
- The NRCR&LF has kept sturgeon for caviar since 2016.
- NRCR&LF and BLDCL have an unspoken mutual agreement to use each other's Haa farm facilities and materials; at the request of DOL, 1 of the 10 ponds will be used by NRCR&LF for sturgeon rearing from March 2024.
- A proposal to open the largest BLDCL ponds (downstream) as a fishing pond is being considered.
- There is a desire to transfer several ponds to BLDCL, as the strain in spring water within the NRCR&LF can avoid growth slowdowns during the winter months without a drop in water temperature. (Proposed at farm manager level)

7) In implementing the Action Plan

In order to operate BLDCL's Haa farms, close cooperation with DOL is considered essential in the followings

- Joint purchase of feed
- DOL to be responsible for intermediate seed growth as much as possible (large seedlings)
- Sharing of aquaculture ponds (rearing ponds), joint management, fixed-term rental from DOL to BLDCL
- Priority use of spring water (spring water with stable temperature), creating water conduits with pipes and channels

- Information (aquaculture technology, programs, market and demand trends) Sharing.
- Reduce production costs and efficiency (amount of feed required, rearing period)

8) Information on other rainbow trout farms

(No. 1) The largest farm on which the NRCR&LF currently supplies rainbow trout seeds is the Hemaline Trout Farm in Paro.

(No. 2) There is a private farm downstream of the NRCR&LF that was once running rainbow trout farming, but is now closed.

(No. 3) In Chhukha Dzongkhag, a new fish farm is under construction and rainbow trout farming will start soon. In order to encourage private sector participation in aquaculture, there are several programs which the DOL covers the construction costs of ponds and provides seeds and a year's supply of feed. The farm in Bongo, Chukha District is one of the farm chosen to the program in 2023, aiming to produce between 0.67 to 35.25 tons per year.

(No. 4) The DOL has a rainbow trout farming program at its center (Trout Breeding Centre and Conservation unit) in Punaka Province. The center was originally built to breed snow trout (Schizothorax richardsonii), but now focuses on rainbow trout farming instead of snow trout rearing.

4.1.4 Direction for solving issues

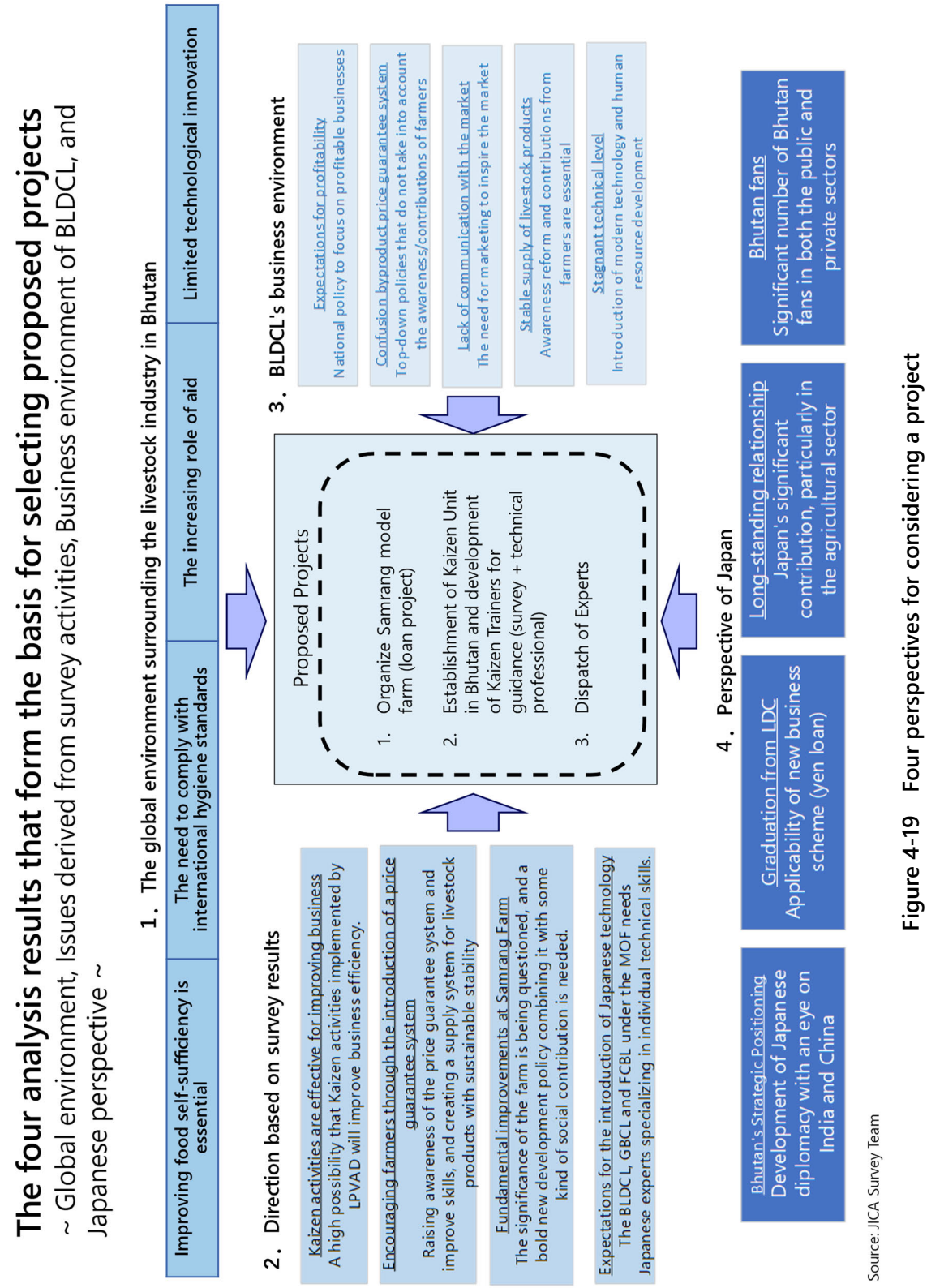
Based on the results of the analysis so far, JICA Survey Team carried out work to identify projects in which Japan could contribute in the next phase. In identifying projects, the following four main perspectives were allowed for.

1. The global environment surrounding the livestock industry in Bhutan
2. Direction based on survey results
3. BLDCL's business environment
4. Perspective of Japan

The analysis content considered from each of these perspectives was described, and the direction taken by combining these perspectives was discussed with the JICA Bhutan Office and the MOF, and ultimately three candidate projects were proposed.

1. Organize Samrang model farm (loan project)
2. Establishment of Kaizen Unit in Bhutan and development of Kaizen Trainers for guidance (survey + technical professional)
3. Dispatch of Experts

The approach to these extractions and the specific content of the consideration are shown in the Figure 4-19 in the succeeding page.



Source: JICA Survey Team

Figure 4-19 Four perspectives for considering a project

4.2 Samrang Farm Improvement Plan

4.2.1 Current situation and issues of Samrang Farm (Livestock Sector)

(1) About management of Samrang Farm (Findings from "Report on Integrated Livestock Production Division, Samrang" by MOF)

1) Separate management and administration of different farms within the integrated system

- Lack of coordination and inadequate standardization of production practice

2) Inefficient utilization of investment

- Unutilized sheds and machinery. Despite unutilized facilities, BLDCL additionally invested to new facilities like two new sheds of parent stock farm
- Efforts should be directed toward proper maintenance, procuring appropriate livestock, and optimizing the use of existing resources.
- Out of grand total of Nu. 423,784,000 (Total grant: Nu. 353,784,000, Total loan: Nu. 70,000,000) of financial assistance and grand received by BLDCL, about 77% (Nu. 324,361,000) of the funds invested to Samrang farm
- A large portion of the operation cost of BLDCL may be spent by Samrang Farm
- ⇒ Proper process of decision making is necessary (capacity assessment, market-oriented, deciding priority)

(2) Dairy Farm

1) Dairy Products

- Main output is production and sales of heifers, production of milk and dairy products
- Productivity is very low (expected milk production: 8 liters/ day ⇒2liters/day). Concentrate feeding was stopped from December 2022 due to budget constraints. However, feeding of milk ration was restarted from December 2023 and is continued.

Table 4-4 Capacity and Actual Use of Dairy Farm

	Capacity	Actual use as of June 2023	As of Feb 2024
Milking cow	60	34	24
Dry cow	40	23	7
Heifers	40	54	40
Calves	30	23	17
Young bull	0	0	3
Total	170	134	91

Source: JICA Survey Team

Source: JICA Survey Team

Figure 4-20 Dairy Cattle in Samrang Farm

2) Equipment

- Wrong specification of procured machine: Since size of teat cups is not suitable cows in Samrang (Jersey), milking machine and milking parlor are not utilized for intended purpose
  ⇒teat cup may be designed for Holstein
- Two walk-in coolers of 1000 and 500 liters are also never utilized
- Currently, milking and processing of dairy product is carried out manually.

Source: JICA Survey Team

Figure 4-21 Portable milking machine and silicone liners

Source: JICA Survey Team

Figure 4-22 Unused bulk milk cooling unit

3) Cattle shed

Despite under utilization of existing facilities and machines, another additional investment was made for construction of new sheds and vermicomposting facility.

Source: JICA Survey Team

Figure 4-23 Unused Cattle Shed

(3) Goat Farm

- Goat shed is used for piggery (30 grower pigs from Yusipang).
- Tentatively 20 goats are kept at calf shed.

Table 4-5 Capacity and Actual Use of Goat Farm

	Capacity	2017	June 2023	Feb 2024
Goat	300	150	18	20

Source: JICA Survey Team

- Goat milking processing unit has not been in operation

Source: JICA Survey Team

Figure 4-24 Goat in Samrang Farm

(4) Layer Farm

- 8 sheds with office, egg washing machine, storing room
- As of June 2023, due to shortage of feed 10,277 birds laid only 5 eggs

Table 4-6 Capacity and Actual Use of Layer Farm

	Capacity	June 2023	Feb 2024
Layer	24,000	10,277	20,612

Source: JICA Survey Team

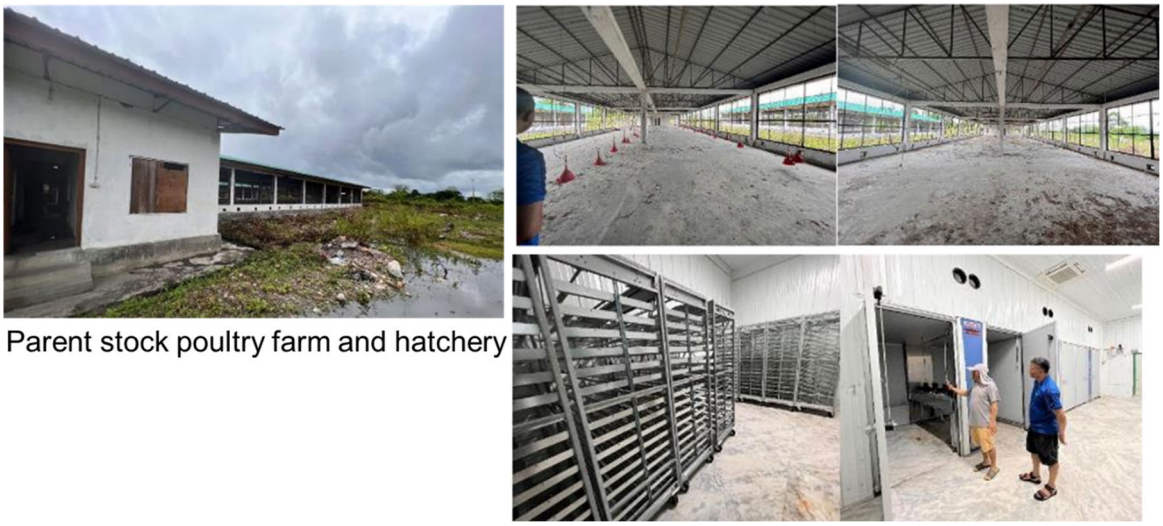
Egg powdering unit is not utilized. Homogenizer is additionally necessary for egg powdering

Source: JICA Survey Team

Figure 4-25 Layout of Layer Farm in Samrang

(5) Parent stock poultry farm & Hatchery

- Parent stock poultry farm was never used. But constructed additionally two PS sheds.
- Hatchery has three egg-setting Incubators and one Hatcher machine. Although it has a production capacity of 60,000 DOC a month, it was not utilized to date other than three times (May to June 2019, June 2019, and April to May 2022)



Source: JICA Survey Team

Figure 4-26 Situation of Parent Stock Poultry farm and Hatchery in Samrang

(6) Suggestion for revival of Samrang farm

- **Setup a Taskforce team**
- **Financial Analysis (overall BLDCL with JICA survey team)**
- **Market research**
  Conduct market research to understand needs of products
- **Review business model**
  Assessing feasibility and profitability of each sector. Assess which sectors of the business are most profitable and focus on strengthening those areas. This may involve scaling back or discontinuing less profitable aspects of operations. Social mandate of BLDCL should be considered (establishment of supply chain of livestock products).
- **Making short-term, medium-term and long-term action plan (if BLDCL has already, please review the plan with MOF)**
- **Conduct PDCA cycle of prepared plan**
- **Transfer technical know-how from the other government agencies, Yusipang and Relangthang**
- **Partially try Kaizen from what you have learnt from workshop (today and 20&21 March). Or once operation of the farm is on track, try Kaizen by learning from the LPVAD**

  Waste elimination. Unutilized assets, equipment and machinery should be sorted based on the revised business model (e.g. handover to the other farms, return to DOL in case beyond capacity of BLDCL, auction, dispose, etc. following BLDCL regulation)

4.2.2 Improvement Plan of Samrang Farm

(1) Challenges of Integrated Livestock Production Division, Samrang (Findings from Field Visiting to Integrated Livestock Production Division, Samrang by the JICA survey team in May 2024)

1) Financial performance over the past three years in Integrated Livestock Production Division, Samrang

Table 4-7 Financial performance of Samrang Farm from FY2021 to 2023

Particular	FY'2021	FY'2022	FY'2023
Income			
Income From Sales	25,352,785.40	28,767,837.77	13,416,339.15
Income From Other Source	1,003,428.00	20,140.00	44,999.00
House Rent Deduction	656,403.00	657,507.00	508,465.00
Total	27,012,616.40	29,445,484.77	13,969,803.15
Expenses			
Animal Development Cost	28,684,080.50	25,929,671.98	17,570,308.90
Product Packaging	923,702.90	2,968,794.31	810,258.10
Administrative Expenses	4,250,646.03	5,451,672.57	6,848,255.29
Official Expenses	300,538.00	323,302.00	25,336.00
Operation & Maintenances	3,348,254.41	505,074.90	621,379.00
Salary & Wages	21,581,849.33	19,519,788.00	10,889,385.36
Depreciation & Amortization	16,739,914.21	15,632,433.23	15,249,517.16
Total	75,828,985.38	70,330,736.99	52,014,439.81
Net Profit/(loss)	(48,816,368.98)	(40,885,252.22)	(38,044,636.66)

Source: JICA Survey Team

2) Past Mismanagement Decisions

Initially, there were three parent stock sheds attached to the hatchery, but despite these not being utilized, two additional sheds were constructed, which remain unused to this day. Priority should have been given to investments in the production, such as purchasing feed. There is also a significant amount of unused equipment and materials, suggesting that, at the time of their introduction, an adequate feasibility study was not conducted very well.

Source: JICA Survey Team

Figure 4-27 Unused facilities and equipment in Samrang Farm

3) Coal contamination of water sources

The rivers that serve as water sources are polluted with coal, affecting all aspects of water use, including household water for local residents and employees, drinking water for livestock, and water for fishponds. Water quality testing results indicate that the water is unsuitable for domestic use. This issue should be considered as a challenge beyond business operations, including its impact on health and food safety, requiring immediate action.

Source: JICA Survey Team

Figure 4-28 Contaminated water with Coal and Water Source of Samrang Farm

(2) Two big challenges need support from other stakeholders (BLDCL alone cannot solve)

1) Contaminated water with coal

Due to water source, the water in Samrang is contaminated with coal and gives negative impacts on animals, human being and especially fish

⇒Needs to change the location of water source

2) Operation of the Hatchery

As of 4th May 2024, under discussion with other stakeholders

⇒Needs to check demands of Day old chicks of either broiler or layers from farmers around S/J and Eastern Areas
⇒or start from supplying Day old chicks to BLDCL farm

Source: JICA Survey Team

Figure 4-29 Two big challenges in Samrang Farm (Contaminated water and operation of the hatchery

(3) Overall recommendation for Samrang Farm (BLDCL alone can solve the issues)

1) Proper recording system

Especially, the dairy section needs individual records to assess the performance of animals and proper decision of farm management

⇒Record for Farm management (including workload, cost and sales, marketing) and Farming records (production and breeding record)
⇒Management of 800 acres (320 ha) by 27 staff including managers needs a lot of unproductive works (clearing bush, making fencing, etc.) and many labors may be shared with such works. Check the workload of staff and allocate the proper number of staff for production purpose. If necessary, inspect or install necessary machines for maintenance work such as mower, grass cutter, cctv, etc.

2) Elimination of waste (starting Kaizen from Muda-dori)

Since there are many idle machines, eliminate unutilized items/equipment

Source: JICA Survey Team

Figure 4-30 Facilities need to apply Kaizen

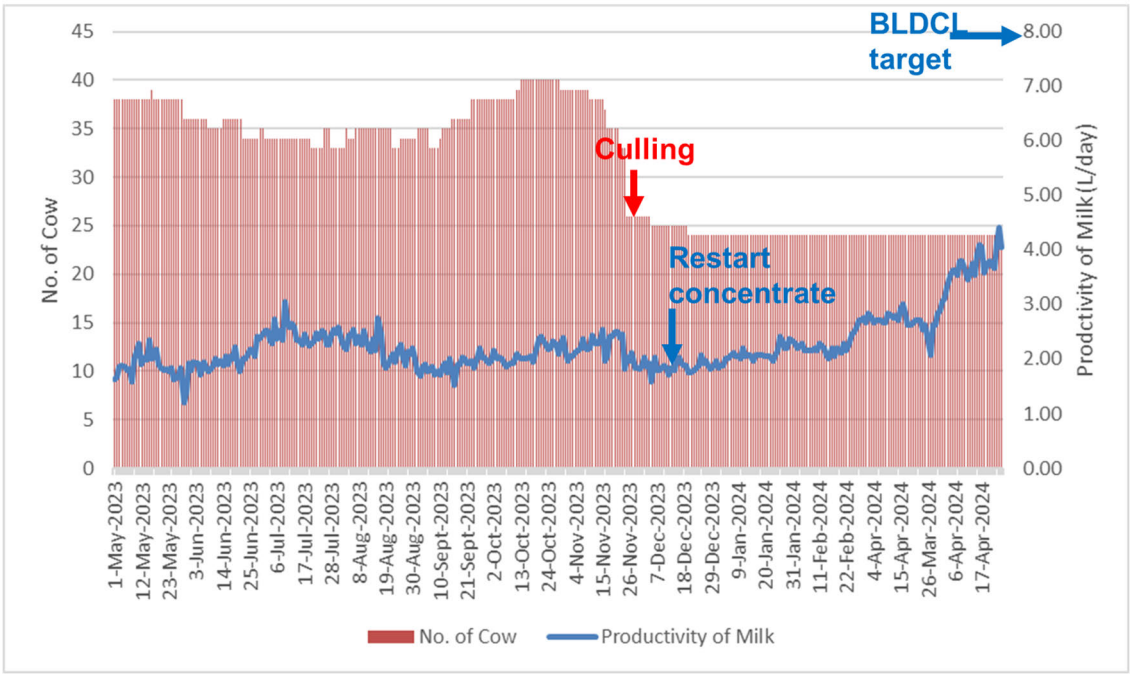
(4) Dairy Unit of Integrated Livestock Production Division, Samrang

1) Needs to restock cattle to use the capacity of the facility

① Decreased stocks from MOF review (June 2023)

- Due to the culling of the unproductive cows in November 2023, the number of cattle under all the categories is decreased.
- Some cows produce only 2L/day. Please evaluate their capacity and decides the sales of them.
- To increase production and productivity of dairy, restock either heifers or calves

Details	Capacity	Actual use as of June 2023	As of Feb 2024	25 April 2024
Milking cows	60	34	24	24
Dry cows	40	23	7	7
Heifers	40	54	40	31
Calves	30	23	17	13
Young bull	0	0	3	0
Total	170	134	91	75



Source: JICA Survey Team

Figure 4-31 Production Performance of dairy cattle in Samrang Farm (1)

Sl. No.	Animal ID	DoB	Lactaion	Milk Production in Liters	ORIGIN	
1	11009183	2019/6/10	1	4	Bhutan	Farm Born
2	11009127	2018/1/30	2	2	India	
3	11000207	2015/4/13	4	2	Bhutan	
4	11009218	2020/4/8	1	4	Bhutan	Farm Born
5	11009148	2018/2/3	3	2	India	
6	11009190	2019/7/28	1	2	Bhutan	Farm Born
7	11000212	2014/12/15	4	3	Bhutan	
8	11009209	2017/3/17	1	3	Bhutan	Need to be sold?
9	11009162	2018/1/1	2	3	Bhutan	
10	11000218	2014/12/31	4	7	Bhutan	
11	11009189	2019/7/19	2	5	Bhutan	Farm Born
12	11009149	2017/2/15	4	7	Bhutan	
13	11009217	2020/4/5	1	4	Bhutan	Farm Born
14	11009225	2020/5/9	1	3	Bhutan	Farm Born
15	11009081	2015/2/18	5	8	India	
16	11009105	2018/1/29	2	5	Bhutan	
17	11009231	2020/5/22	2	4	Bhutan	Farm Born
18	11009119	2018/2/15	4	2	India	
19	11000219	2017/3/23	5	7	Bhutan	
20	101000512	2017/10/26	3	3	Bhutan	Bumthang
21	11000211	2017/2/28	4	6	Bhutan	
22	11009175	2018/4/22	2	6	Bhutan	
23	11009193	2019/8/5	1	4	Bhutan	Farm Born
24	1109 900030	2020/7/21	1	4	Bhutan	Farm Born

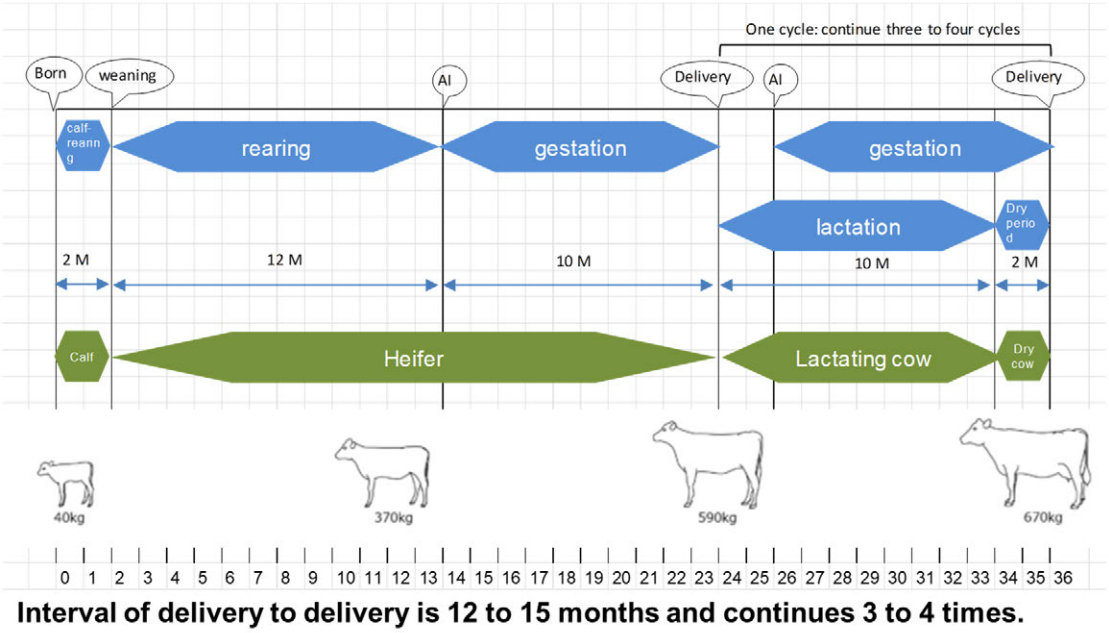
Source: JICA Survey Team

Figure 4-32 Production Performance of dairy cattle in Samrang Farm (2)

	As of May 1, 2024														
	LACTATING COWS		1st AI	2nd AI	3rd AI	4th AI	5th AI	6th AI	7th AI	8th AI	1st calving	Expected first delivery	2nd calving	3rd calving	4th calving
Sl. No.	Animal ID	DoB													
1	11009183	2019/6/10	2021/8/24	2021/9/13							2022/6/14	2021/6/9			
2	11009127	2018/1/30	2019/7/14	2020/6/23	2020/8/25	2020/12/12	2021/1/29	2021/5/15	2021/6/28	2021/9/8	2020/4/20	2020/1/30	2022/6/18		
3	11000207	2015/4/13	2019/10/19	2020/11/8	2020/12/10						2020/8/13	2017/4/12	2021/9/17	2021/9/17	
4	11009218	2020/4/8	2021/10/27								2022/7/7	2022/4/8			
5	11009148	2018/2/3	2020/12/1	2021/10/8							2021/9/8	2020/2/3	2022/7/13		
6	11009190	2019/7/28	2021/10/7								2022/5/14	2021/7/27			
7	11000212	2014/12/15	2018/11/16	2021/2/6							2019/8/17	2016/12/14			
8	11009209	2017/3/17	2021/11/21	2022/9/11							2023/6/15	2019/3/17			
9	11009162	2018/1/1	2020/4/17	2021/4/20	2021/12/26						2021/1/18	2020/1/1	2022/3/19		
10	11000218	2014/12/31	2020/8/27	2021/4/21	2020/12/10	2022/1/23	2022/7/21				2022/1/26	2016/12/30	2023/4/28		
11	11009189	2019/7/19	2021/10/2	2022/9/26	2022/10/16						2022/5/16	2021/7/18	2023/6/5		
12	11009149	2017/2/15	2019/2/18	2021/12/12	2019/6/26	2020/8/3	2020/8/24	2022/9/13			2022/9/29	2019/2/15	2020/4/8	2023/6/26	
13	11009217	2020/4/5	2021/11/7	2022/9/9							2023/6/9	2022/4/5			
14	11009225	2020/5/9	2022/1/19	2022/10/1							2022/6/2	2022/5/9			
15	11009081	2015/2/18	2020/7/2	2020/11/6	2021/9/19	2022/10/21					2021/5/24	2017/2/17	2021/8/23	2022/6/28	2023/7/29
16	11009105	2018/1/29	2020/6/17	2020/7/27	2020/11/22	2021/2/12	2022/9/13				2021/11/22	2020/1/29	2023/7/9		
17	11009231	2020/5/22	2021/9/19	2022/10/26							2022/7/11	2022/5/22	2023/7/24		
18	11009119	2018/2/15	2020/6/13	2020/7/1	2021/10/21						2022/7/18	2020/2/15			
19	11000219	2017/3/23	2020/8/3	2021/3/14	2021/5/17	2021/6/23	2022/11/6				2022/3/30	2019/3/23	2023/8/13		
20	101000512	2017/10/26	#N/A									2019/10/26			
21	11000211	2017/2/28	2019/8/14	2020/11/18	Fertility rate (success rate of AI) is 59% and not bad. But raring and gestation period is long as yellow shows. Why? (first estrus is not seen?)						2020/5/14	2019/2/28	2021/8/11		
22	11009175	2018/4/22	2021/11/21	2022/12/13							2022/9/9	2020/4/21	2023/9/10		
23	11009193	2019/8/5	2021/11/21	2022/12/17							2023/9/17	2021/8/4			
24	1109 900030	2020/7/21	2021/9/12								2022/6/25	2022/7/21			

Source: JICA Survey Team

Figure 4-33 Reproductive performance of dairy cattle in Samrang Farm

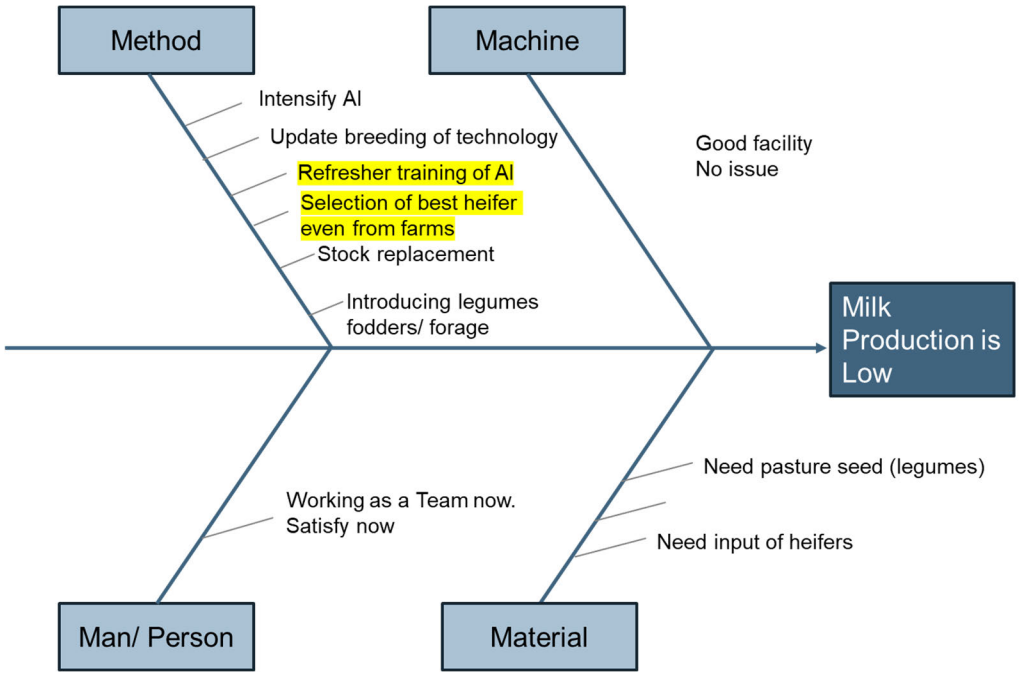


Interval of delivery to delivery is 12 to 15 months and continues 3 to 4 times.

Source: JICA Survey Team

Figure 4-34 Life cycle of cow Female Cattle

Fish bone diagram of Dairy farm, Samrang. Most critical challenge is "Breeding and reproduction"



Source: JICA Survey Team

Figure 4-35 Fish Bone Diagram of Dairy farm, Samrang Farm

(5) Immediate Recommendation for Dairy Samrang Farm (BLDCL alone can solve the issues)

- **Send AI technician for refresher training course of AI practice**

  Dairy section needs immediate improvement of breeding practice. Of course, reproduction is always related to feeding and other management. Animal feeding should be maintained as it is.

- **Replacement of cows should be always based on records (breeding, production, financial, etc.)**
  - ➢ Set up proper recording system especially for individual cows
- **Good pastureland having enough carrying capacity of animals. Maintain and develop more (especially introducing legume fodder)**

Source: JICA Survey Team

Figure 4-36 Good pastureland in Samrang Farm

- **Kaizen Activities**

  As of May 2024, Kaizen activities had not yet been initiated at this farm. Given the experience of Kaizen with LPVAD, it is important to expand Kaizen activities horizontally within BLDCL. The focus should begin with the removal of unnecessary equipment and materials (eliminating waste).

Source: JICA Survey Team

Figure 4-37 Agricultural Machinery and Dairy Unit in Samrang Farm

- **Operation of the Hatchery and Parent Stock Facilities**

  A sub-cabinet consisting of entities such as the MOF is considering intervening to support BLDCL. The operation of the hatchery is deemed a top priority . BLDCL needs to examine whether the operation of a broiler hatchery can be a viable business for a state-owned enterprise.

Profitability of Each Livestock Unit

- Regarding pig farming and layer chickens, profitability seems achievable based on the performance of Yusipang piggery farm and Relangthang layer farm. However, attention must be paid to the tendency of egg prices to decline toward summer.
- For the dairy sector, technical improvements are required (e.g., actions to enhance reproduction and production performance, introduction of an appropriate record-keeping system). The target is to achieve 8 liters/day per cow.
- The dairy section has a capacity for 170 cows, but currently only 75 are being raised.
- There are 24 ha of pastureland, offering development potential for goat farming. There is also market demand (e.g., selling six-month-old goats to nearby farmers). However, since only 30 goats are currently being raised, the introduction of breeding goats is necessary.

4.2.3 Current situation and issues of Samran (Aquaculture field)

(1) Samran basic information

The development of the farm, which is dotted with various facilities such as aquaculture, poultry farming, dairy farming (dairy cattle) and livestock farming (goats and pigs), was completed in 2017, with an investment of Nu. 89.291 million on 40 acres of land surrounded by forests. At the time of completion, each facility was reportedly managed by a different Division within the Department of Livestock Production and located on the same site, but without any horizontal linkages. The entire facility was rarely used after its completion and all facilities were transferred to BLDCL in the same year.

Source: JICA Survey Team

Figure 4-38 Overall of Samran farm and distribution of facilities

1) Overview of aquaculture facilities

In 2017, a total of 7 staff (1 technical staff member and 6 aquaculture assistants) were also assigned to BLDCL following the transfer from DOL, but by 2024 the number of staff in the aquaculture sector was reduced to only 1 manager and 1 assistant. In addition, the only aquaculture-related facilities are

ponds. It does not include hatcheries for seed production or fry rearing facilities. The total pond area is 49,755m² (32 ponds with an average size of 1,555m²) and is rationally designed to allow water supply and drainage on a slope. There are three water supply systems, including sub-systems, but due to the water problems described below, only four ponds (currently filled with water) are in operation (No. 13, 14, 15 and 21).

Source: JICA Survey Team

Figure 4-39 Overall of Samran ponds

Table 4-8 Condition of each water source

Water source			Usage condition		
			Current condition	Winter (Nov. - Mar.)	Summer (Apr. - Oct.)
① Main	River water	Takes water from the river (Kali Khola River), 5 km from the ILPV and 2 km upstream from the bridge, but water pollution due to coal seams occurs.	In summer (rainy season), water intake is stopped due to rising water levels and increased pollution. In winter (dry season), river water has to be used because the stream water (sub 1) gets dry. However, the level of pollution is relatively low in winter because of reduced rainfall.	With use	No use
② Spare	Spring water (stream water)	Streams (tributaries) occur in the surrounding forests at various locations. Water is piped in from several streams with relatively high water amount.	Used in summer (April-October) when rainfall increases. Not available in winter as it gets dry.	×	○
③ Spare 2	Stream water (piped water from community water sources)	The Samran community obtains water for domestic use from a pipe about 7 km upstream, and when water is desperately needed at the Samran farm, they ask the community representative to share water for the farm as a last request.	Water is available all year round, but not in large quantities as it is used for community domestic use. Positioned as emergency use.	△	△

Source: JICA Survey Team

2) Production record

When the facility is completed, it is calculated to have an annual aquaculture production capacity of 120 tons. A lot of fish is imported into Bhutan from India, but some fish farmers are reportedly using formalin to prolong the preservation of fish (fresh fish) at room temperature, as revealed by a BFDA inspection a few years ago. This has become an issue from a food safety perspective, and the need to increase the supply of fish through fish farming in their own country, and the Samran farm's aquaculture operation was expected to supply domestic fish to replace imports from India. However, since the transfer of the facility in 2017, actual aquaculture production has been at its highest in 2021 with 7.3 tons produced, which is only 1-6% of the 120 tons per year production target.

Table 4-9 Samran farm pond size

Sl	Table Fish Pond TFP No	Pond water body area (M2)			
		l (Length)	B (Width)	H (Depth)	Total
1	TFP.1	52	28	1	1456
2	TFP.2	50	30	1	1500
3	TFP.3	57	30	1	1710
4	TFP.4	53	28	1	1484
5	TFP.5	53	23	1	1219
6	TFP.6	54	27	1	1458
7	TFP.7	54	28	1	1512
8	TFP.8	52	27	1	1404
9	TFP.9	53	28	1	1484
10	TFP.10	54	28	1	1512
11	TFP.11	61	25	1	1525
12	TFP.12	61	25	1	1525
13	TFP.13	62	26	1	1612
14	TFP.14	61	25	1	1525
15	TFP.15	61	25	1	1525
16	TFP.16	66	20	1	1320
17	TFP.17	56	26	1	1456
18	TFP.18	59	28	1	1652
19	TFP.19	60	28	1	1680
20	TFP.20	60	28	1	1680
21	TFP.21	60	27	1	1620
22	TFP.22	61	26	1	1586
23	TFP.23	70	28	1	1960
24	TFP.24	70	23	1	1610
25	TFP.25	70	22	1	1540
26	TFP.26	72	26	1	1872
27	TFP.27	72	24.2	1	1742.4
28	TFP.28	72	24	1	1728
29	TFP.29	58	22	1	1276
30	TFP.30	58	21	1	1218
31	TFP.31	58	28	1	1624
32	FP.32	58	30	1	1740
					49,755

Source: JICA Survey Team

Table 4-10 Samran farm aquaculture production plan and production record

Year	Revenue *		Quantity (Meats Mts)	Percentage of targets achieved on a weight basis
	Forecast	Actual		
2018	25.83	0.01	1.853	1.5%
2019	27.12	0.352	3.459	2.9%
2020	28.48	0.767	6.602	5.5%
2021	29.90	1.885	7.256	6.0%
2022	31.40	2.032	0.666	0.6%
2023	32.97	0.186		

*Unit of currency is unknown (not stated in report)

Source : REPORT ON INTEGRATED LIVESTOCK PRODUCTION DIVISION, SAMRANG : Ministry of Finance

Source: JICA Survey Team

No new fry are released after 2023, and the remaining fish are sold on several to several dozen kilos per month to the local community.

3) Aquaculture method

The DOL's National Aquaculture Center (Samrang Regional farm) is located approximately 24 km from Samran Farm. After the completion of the facility, 8,000 carp seeds (fry size, <2 cm) produced at the Farm were released into 1 pond (1,600 m³) at a stocking density of 5 fish/m³ (total of 6 fish species). Subsequent additional releases and current stocking quantities have not been confirmed and are unknown. The water temperature is said to drop to nearly 10°C in winter. However, no such record remains in the water temperature data provided by the farm and the water temperature was generally

above 25°C (year-round: 21°C to 31°C), which is in the temperate to temperate to tropical zone. (Winter water temperature data is unknown and not known to BLDCL).

Table 4-11 6 fish species farmed in Samran

Species	Common carp	Grass carp	Silver carp	Rohu (Roho labeo)	Mrigal carp (Indian carp)	Catla
						
Spawning/Breeding season	Mar-Apr	May-Jun	May-Jun	Jul - Aug	Jul - Aug	Jul - Aug
Distribution of fingerling (only the season available)	Apr-May	Jun-Jul	Jun-Jul	Jul - Aug	Jul - Aug	Jul - Aug
Size of stocking	< 2cm (1-2months after hatching)	ditto	ditto	ditto	ditto	ditto
Ratio of stocking number	15-20%	3-5%	7-14%	22-30%	38-47%	1%

Source: JICA Survey Team

4) Feeding

It is a non-feeding, extensive aquaculture. 6 species of fish with different feeding habits are poly cultured, basically feeding on algae, phytoplankton and detritus that naturally thrive in the ponds with no water change, and waiting for natural growth. Grass carp are fed grass (Napiergrass) that thrives on the farm. There are 32 ponds, but only 4 are currently in use. The target harvest size is over 500g, and large individuals are thinned out and shipped on order. The sale price of harvested fish is Nu. 280/kg. According to the farm manager, the price of feed is Nu.74 / kg, which should be profitable enough for the calculations.

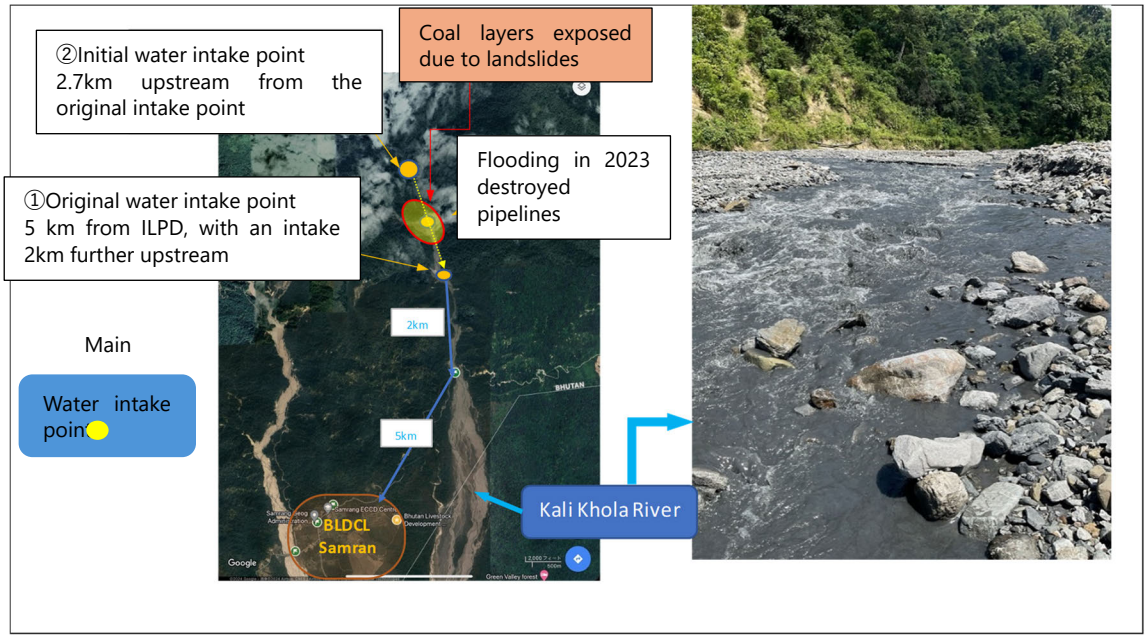
5) Rearing period required for growth

Target harvest sizes are Common carp: 500 to 600g, Grass carp, Silver carp: 1g, Rohu, Mrigal, Catra: 500g. The production plan was based on the assumption that, if fed, each species would grow to between 500g - 1kg in 9 months and be ready for harvesting, but in fact, in the 2020-2021 rearing, none of the fish reached 500g, and about half were less than 200g.

Fish size	Rate
400-500 gms	20%
200-400gms	30%
50-200gms	35%
15-50gms	15%

6) The problem of water sources for fish farms

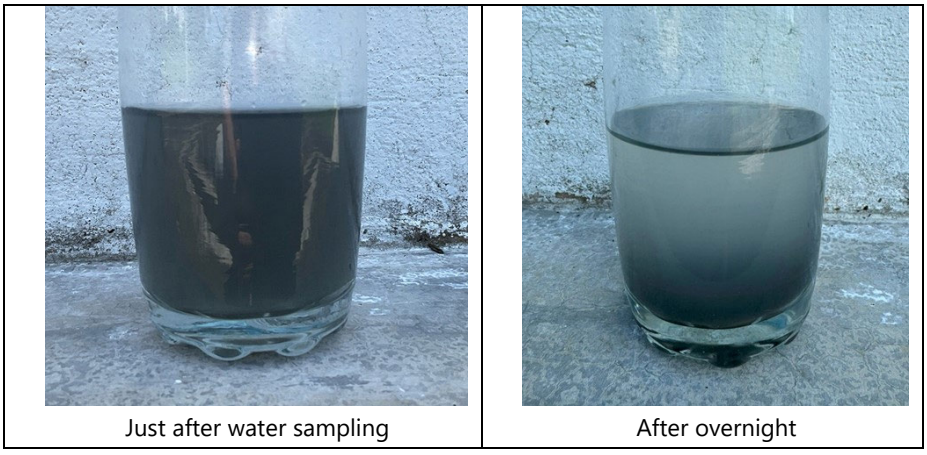
There are 32 ponds, but only 4 of these are actually used, with the other ponds lying unused. The main water source is a river (the Kali Khola River), but there are coal seams exposed in the upstream, and when there is a lot of rain or there is a landslide, black, muddy water (black water that has dissolved from the coal seams) flows into the river. In order to deal with this, it was necessary to draw water from a point considerably upstream of the coal strata, and a system was set up to draw water from a new intake point (a simple weir) upstream (2.7 km upstream from the existing intake point) and lay pipes to the center, but in 2023 the pipes were destroyed in a landslide. As a result, it is currently not possible to draw water from the upstream area, which is not contaminated, and only blackish-brown water contaminated with coal can be used.



Source: JICA Survey Team

Figure 4-40 Water source plan

As for other water sources, the area around the Samran farm is covered in forest, and in the summer (April to October), when there is a lot of rain, water from the springs that appear in the mountains around the farm is led to the farm using simple pipes (rubber hoses), but the water amount is insufficient. This is the main reason why the 32 fish ponds are not being used.



Source: JICA Survey Team

Figure 4-41 Farm water taken from the Kali Khola River

7) Ice factory (ice machine)

There is an ice machine that was introduced in 2022, and it is used when ice is needed for shipping meat, fish, etc. from the farm. The frequency of use depends on the demand for ice, but it is used about 2 to 3 times a month. It can make 320kg of block ice in 5 to 6 hours. The water used for making ice is river water. During the rainy season, they can use the clear water from the streams around the farm, but in winter (October to March) the streams dry up, so they have no choice but to use the black water contaminated by coal. They could ask the neighboring communities to share their water, but the communities don't have an abundance of water, so they are sharing what they have. At present, it is not possible to obtain ice from the neighboring communities (there are ice shops only in India), so the Farm is considering selling ice to outside customers in the future.

Source: JICA Survey Team

Figure 4-42 Ice machine in Samrang Farm, July 25th 2024

8) DOL's aquaculture center RCA Bangtal (reference information)

There is a Regional Aquaculture Center (RCA) Bangtal under the jurisdiction of the government (DOL) in Bangtal, 24km west of the Samran Farm of BLDCL. The aquaculture center has ponds for parent fish and fry, and produces fry of 6 species, supplying them to private aquaculture farms. After hatching, the 3-5cm fry are reared for about 3 months and then sold to fish farms in the province at a rate of Nu. 0.5 / fish. Of the 6 species, common carp, grass carp and silver carp are the most popular, while rohu, mrigal and catla are not.

The seeds production season for common carp starts as early as January, followed by silver carp production, which continues until July. On the other hand, the production season for rohu, mrigal and catla is a short period from June to July in the summer.

* Water issues

RCA draws water from a nearby river (Bakuli River), but, like the Samran farm of BLDCL, it has been affected by the problem of black water caused by coal pollution. There are many exposed coal seams in this area, and this suggests that similar problems may occur in other rivers. For this reason, RCA does not rely on a single river, but also uses the clear water of tributaries. The water taken from the river is stored and the water that has been physically filtered is used in the hatchery. Even so, the hatchery is still reared in blackish-brown cloudy water, and the performance, such as the hatching rate and survival rate, is lower than that of the National Research Center of Aquaculture (NRCA) in Guelph.

Mrigal fry being reared after hatching in an indoor hatchery

Silver carp reared in an outdoor pond

Water stored and physically filtered in the center part is used in the hatchery

Source: JICA Survey Team

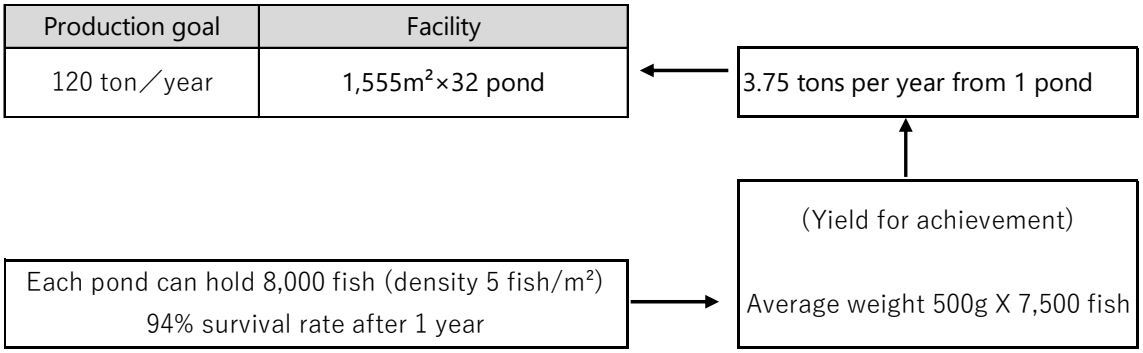
Figure 4-43 RCA Bangtal

(2) Samran Farm Improvement Plan (Aquaculture)

1) Re-consider the production plan

<Original production plan>

When Samran Farm was first established, it is said that there was a plan to produce 120 tons of fish per year. As shown in the figure below, if it is assumed that each pond holds 8,000 fish and that they are reared for 1 year (in reality, pond drying is also used to prepare for the next cycle, so it will be assumed that they are reared for 10 months), and that the survival rate is 94% or more and that the average fish weight is 500g, it seems that this is achievable based on calculations.



Source: JICA Survey Team

Figure 4-44 Calculation of production goal

The reality, however, is that in 2020-2021, the fish did not reach 500 g after one year of rearing, with about half of the fish weighing less than 200 g. This is partly due to the lack of feeding, but only seeds of less than 2 cm were released, and such high growth (average 500 g in one year) is unlikely to be achieved in pond farming without water inlets. Also, due to the nature of the fish species, the timing of seeds (breeding season) is different, and in mixed stocking they are released at different times between April and August. Fish at different growth stages are mixed, which is difficult to manage when conducting feed-fed aquaculture, and in addition, feeding is expected to decline during the low water temperature period from November onwards, resulting in significantly lower feed efficiency for the pond as a whole. Therefore, if the same aquaculture methods are continued, even if the water problem (black-brown water problem due to coal pollution) is solved, it is considered impossible to achieve the originally planned production levels.

Table 4-12 Timing of the start of aquaculture considering the seeds production season for each fish species

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common carp												
Grass carp												
Silver carp												
Rohu												
Mrigal carp												
Catla												

Source: JICA Survey Team

<Practical production planning>

The following problems have been identified in Samran aquaculture.

■ **Aquaculture problems**

① Water (water source pollution)
② Polyculture (Is no-feeding and reduced-feeding extensive aquaculture appropriate for the business?)
③ Seed size is small (1 month after hatching) and not suitable for direct release (high initial depletion).
④ The timing of seed release is not appropriate (→ initial depletion is high, especially as additional seeds are released into mixed ponds).
⑤ Low water temperatures during the winter and reduced feeding rates (reported to be close to 10°C, according to the farm manager).
⑥ Growth stagnation due to inadequate or inappropriate feeding

Firstly, the following measures should be recommended for ① water (water source pollution) above.

■ **Water (water source pollution)**

- Give up re-laying intake pipes for river water use and develop other water sources.
- Is there any possibility of groundwater utilization? (The nearby Garzon project has drilled and hit groundwater at a depth of 50-80m. They have succeeded in securing an ample supply of clean water)
- If groundwater utilization is not fulfilled in the above, it is not realistic to continue the aquaculture project.

■ **Regional development**

With the increasing number of households settling in neighboring communities due to the Samran settlement (currently more than 50 households, shops, schools, hospitals and police have been established), water shortage (ensuring good quality water) is an issue not only for BLDCL-Samran farm but also for the region. If geological and groundwater investigations (borehole investigations, soundings and groundwater surveys) are to be carried out, a budget like a community development fund will be prepared.

Then, on the assumption that the above water problems have been solved, it is suitable to switch to realistic aquaculture methods. The following improvements and modifications can be made to aquaculture to enable a realistic production plan.

Review of aquaculture methods

No.1: Are seed availability, timing of release and size issues, as well as is polyculture really an appropriate method of aquaculture?

➔Seeds are additionally released into fish ponds from small individuals (1 month after hatching), but initial depletion is likely to be high because of the additional release into polyculture ponds. After initial rearing in hapa nets and intermediate rearing (nursery), the seeds are released into ponds when they have grown to 5 cm or more.

➔Stop polyculture of 6 fish species. For example, as the first batch (early birth group), 3 species of fish - Common carp, Grass carp and Silver carp - are started in about one-third of the ponds. Then, as the second batch (medium to late birth group), the three species Rohu, Mrigal carp and Catla are reared in the remaining one-third of the ponds.

No.2: Countermeasures for low water temperatures (reported to be close to 10°C in winter, according to farm managers)

➔Prepare enough depth of fish pond. Currently, all ponds are approximately 1 m deep. Without the Nursery ponds (Hapa net ponds), rearing ponds should be excavated deeper to a depth of 1.5 m to avoid growth stagnation during low water temperatures.

➔Plan production schedule in advance so that the harvest can be conducted before the low water temperatures period. (For example, prepare juvenile in anticipation of the harvest season, and release the right size before April.)

No.3: Poor growth due to inadequate or inappropriate feeding

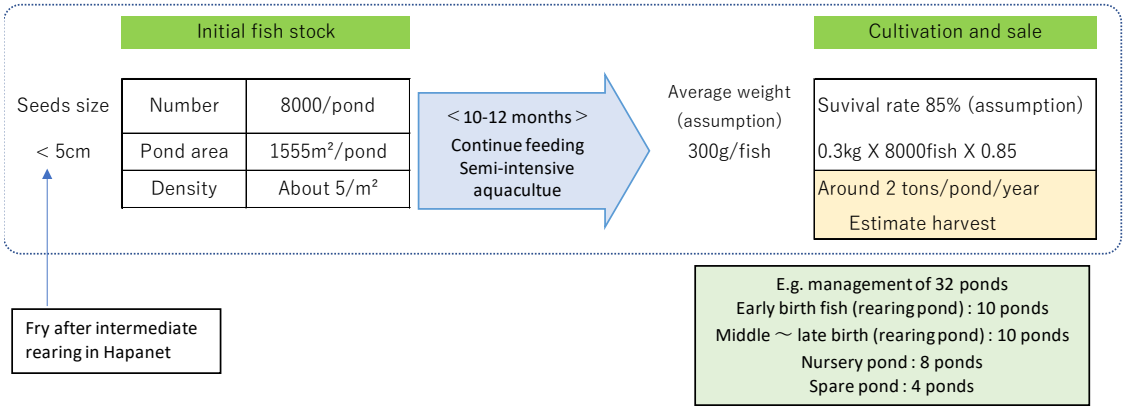
➔Cease the current style of extensive aquaculture without feeding and with fertilization, return to feeding aquaculture.

➔Always ensure that food is available and never allow periods without feeding.

Source: JICA Survey Team

Figure 4-45 Installation of Hapa net in ponds for initial to intermediate rearing (Nursery)

By this, it is possible to plan operations with a production target of up to 40 tons (2 tons x 20 ponds) per year.



Source: JICA Survey Team

Figure 4-46 Calculation of production target

The above plan also requires the following inputs.

2) Consideration of groundwater usage

The following steps should be taken to consider the use of groundwater as water for aquaculture.

【Step】

① Investigation of groundwater veins

Before drilling a well, a borehole survey is carried out to ascertain the geology and the presence of groundwater. This will determine the depth of groundwater, soil stratigraphy and the presence or absence of bedrock. It is advisable to commission a survey company to carry out the appropriate survey. Based on the results of the survey, the depth and location of the well should be determined. Conduct a water quality survey in advance just to be sure that the water is suitable for aquaculture.

② Well design and drilling

Based on the results of the drilling survey, design the wells and drill them in appropriate locations. Drill to a depth that reaches the groundwater veins to ensure a stable water supply.

③ Install well casing

Install well casing (well pipe) on the inner wall to prevent the inside of the well from collapsing

④ Installation of pumps

Install an appropriate pump according to the depth of the well. If the well is powered by electricity, also wire the power supply and control system. The use of an engine pump is also an option as it does not need to be in constant operation. In selecting a pump, the pump head and the amount of water supply should be considered.

⑤ Installation of water supply pipework

Install pipes from the pump to the aquaculture pond. The thickness and material of the pipes should be selected according to the distance and water volume. Also, install valves along the way so that the water supply can be adjusted.

⑥ Installation of a filter system.

As well water may contain sand and small matter, a filter should be installed in the middle of the water supply pipework to prevent small matter from entering the aquaculture ponds.

⑦ Installation of water supply system for aquaculture ponds

Install water supply inlets and flow control valves to supply water to the aquaculture ponds.

⑧ Checking and adjusting operation

Test the entire system to ensure that the pump is working, that there are no leaks in the pipework and that the water supply to the aquaculture ponds is appropriate.

The following equipment and works are required for this project.

Table 4-13 Necessary materials and machines

Borehole survey equipment	(Procure contractor)
Well drilling equipment	(Dependent on depth of excavation and geology)
Well casing	(PVC or stainless steel)
Pump	Pumps for deep or shallow wells, power supplies and control equipment
Water supply pipes	(Diameter and material according to distance and water volume)
Valves	Valves for adjusting water supply amount, float valves (for automatic water level adjustment)
Filter	(To remove sand and small matters)
Electricity facilities	Power cables and breakers for pumps
Others	Connection fittings, sealing materials, tools, etc.

Source: JICA Survey Team

3) Organizing systems for aquaculture operations.

The following equipment and materials should be provided for aquaculture operations

Table 4-14 Input materials and consumables

1. Seeds	160,000 fish (8,000 fish X 20 ponds)
2. Feeds	60 tons (for production of 40 tons)
3. Water quality control materials	Oxygen supply equipment (aeration system or oxygen pump)
	Water thermometer, oxygen meter
	Water quality test kit: capable of measuring pH, ammonia, nitrite and nitrate
	Filters and bacterial agents for purification
	Lime, sodium chloride
4. Disease prevention and treatment materials	Medicines: prevention and treatment of parasites and bacterial infections (e.g. methylene blue, potassium permanganate)
	Disinfectants: use in disinfection of ponds and equipment (e.g. sodium hypochlorite, ethanol)
	Vitamin supplements: vitamin and mineral additives
5. Feeding management equipment	Feed preparation machines (mixers, granulators)
	Feeding machines: automatic feeding machines
	Feed and feed ingredient storage (volume: 3 tons)
6. Other materials	Cleaning equipment: nets and brushes for regular cleaning
	Catch nets and cages: needed for shipping and sorting
	Power supply and generator: to ensure power for oxygen supply equipment and feeders in emergencies

Source: JICA Survey Team

As it takes nearly a year from the start of rearing to harvesting, necessary materials should be provided for during this period. In particular, adequate provisions should be made for feed. In addition, the technical staff and pond manager should be at least eight workers (1 person manages 4 ponds), plus a manager and an office administrator.

4) Income and expenditure from aquaculture operations

Expenditure on aquaculture operations was estimated using provisional unit prices and volumes. Assuming the unit price is Nu. 280 / kg, there would not be a negative balance, but a little profit.

However, the sales unit price of Nu. 280 / kg was information from the Samran farm, but was Nu. 220 / Kg when interviewed at RCA Bangtal. Interviews at meat shops in Thimphu and Paro also indicate that catla and rohu (frozen) imported from India are sold at Nu. 300 / kg, while the purchase price by dealers is reported to be less than Nu. 200/kg. If they were to compete with these prices, they would operate at a loss. In order to make the aquaculture business profitable, the selling price must be set 1.4-1.5 times higher than that of imported fish.

Annual income and expenditure estimation

	Item	Amount	Unit price		Sub total (Nu)
Expen	Seed	160,000 Fish	0.5 Nu/fish		80,000
diture	Feed	60 Tons	74 Nu/kg		4,440,000
	Other material and consumable	12 Month	100,000 Nu/set/month		1,200,000
	Operation and management fee	12 Month	150,000 Nu/set/month		1800000
	Labour cost	120 Person (10X12mon	30,000 Nu/month/person		3,600,000
				Total	11,120,000

		Amount	Unit price		Sub total (Nu)
Income	Harvested fish sale	40 Tons	280 Nu/kg *Samran farm information		11,200,000
				Total	11,200,000
				Balance	80,000

Source: JICA Survey Team

Figure 4-47 Calculation of balance

APPENDIX 5 RESULTS OF THE CONSUMER PREFERENCE SURVEY IN THIMPHU

5.1 Background to the Preference Survey

The purpose of this survey was to demonstrate to BLDCL and MOF the need for market research and the methods for conducting it. Therefore, if the survey could demonstrate the purchasing preferences of consumers, even if not accurately, it would consider that the original purpose of the survey had been achieved. This was based on the following background.

- The person in charge of BLDCL's marketing-related unit had only been employed for a short time and had no experience of carrying out actual market research.
- The person in charge was only engaged in wholesale operations based on conventional pricing on a day-to-day basis, and did not have the time to consider consumer purchasing characteristics or market feedback.
- In order to improve the quality of BLDCL products, it was necessary to recognize the importance of an external marketing approach as well as Kaizen.

As the budget for the JICA survey was not initially included, the JICA Bhutan Office kindly secured the minimum necessary budget. As it was necessary to implement the survey within a short period of time with a limited budget, the process shown in (2) below was followed. Although some of the processes were insufficient for a survey, JICA Survey Team believes that the above-mentioned objectives were sufficiently achieved.

- The Bhutanese consultant (individual) to be commissioned to carry out the survey was decided upon based on recommendations from both the MOF and BLDCL (as there was no time to follow the process of re-commissioning).
- The JICA survey team prepared a draft questionnaire for use in the interview survey, and then completed the questionnaire by incorporating comments from the BLDCL and MOF.
- The work was outsourced to the consultant. Due to the consultant's circumstances, the survey period was longer than expected. In addition, the consultant employed individual surveyors, so it was not possible to ensure that everyone understood the purpose and content of the questions.
- As a result, abnormal values and unexpected results were found during the survey compilation stage. After taking these deficiencies into account, the JICA survey team compiled the results of the consumer preference survey and presented them at a seminar in September 2024.

5.2 Methodology and Work Plan

As mentioned above, the questionnaire incorporated the expertise of the JICA Survey Team, the concerns of the BLDCL and MOF, etc. JICA Survey Team asked the consultant to complete the work by the end of July 2024, but due to personal reasons, the start of the work was delayed significantly, and it took approximately two months from August to September 2024. In terms of content, if the employment of the researcher goes smoothly, it is thought that the work will take about two weeks, including the preparation of the report, but there are unavoidable parts due to the extension of the period for securing the budget and the amount of budget. Considering that the final deadline was for the presentation at the seminar held at the end of September, there was no other adverse impact.

The following are attached in this Appendix.

- Market Preference Survey specifications & questionnaire

5.3 Survey results

As shown above, it is difficult to say that the terminal surveyors at the end of the chain of command fully understood the intentions of this preference survey. As its correspondence, the JICA Survey Team has taken a bird's eye view of the survey report prepared by the consultant and has summarized the gist of the survey results.

The following are attached to this Appendix.

- PowerPoint presentation and report prepared by the Bhutanese consultant
- Prepared Purpose of the above report (PPT) by JICA Survey Team

Attachment: Market Preference Survey Specifications & Questionnaire

Consumer Preference Survey for meat, fish and Livestock Processed Products in Thimphu

Operation Plan

1. Items to be clarified

- Information availability and product preference of the public for livestock products
- Purchases and purchase prices of public by item (chicken, pork, bacon, sausage etc.) and by income level of purchaser
- Frequency of purchase of BLDCL products and imports
- Prices of imports from India for items corresponding to BLDCL's selling list
- Preference for consumption of trout

2. Methods

- Interviews with WalkIn customers of retailers at BLDC's products retailer toward 20-50 valid responses.
- The income strata (4-5) in Bhutan should be defined by the Contractor. This stratification will be agreed upon with the JICA survey team prior to the survey.
- A minimum of 5-10 samples will be taken from each income stratum (10 samples / Max 5 stratum = 50 samples).

Example:

- Income Strata 1 0 -300,000
- Income Strata 2 300001 -400000
- Income Strata 3 400001 -650000
- Income Strata 4 650001 -1000000
- Income Strata 5 1000001 and above

- For questions "Ⅴ. Social survey on trout supply and consumption (hotels and restaurants only)," the names of the hotels and restaurants should be identified by the Contractor, and at least 5 companies in total (at least 1 company in each category) will be interviewed.

（Category)

- High Grade Hotel&Restaurant: 5star (Example; Meridian, Culture Coffee)
- Middle Grade Hotel&Restaurant: 3-4 star
- Common Grade Hotel&Restaurant: < 2star

The following deliverables shall be submitted

A) Report of survey results (PPT)
B) Survey tabulation Excel sheet
C) Presentation of the results to JICA Bhutan Office, JICA_HQ, and relevant organizations in Bhutan at the Wrap Up meeting to be held in October-November 2024, and before and after the Wrap Up meeting.

3. Implementation Schedule

- Implementing period should be within One month after the contract is awarded (maximum date: July 10, 2024 (Wednesday))

4. Contractor

- A basic contract for the implementation of the project will be awarded to Mr. Tshewang Jurmey. The budget is approximately Nu.500T.

Information from Marketing Distribution Unit

- Slaughter pigs, Live chickens and trout are transferred from Yushipan and Haa to LPVAD. Products include pork/poultry (sold in various parts), frozen trout, processed products (broilers, sausages). Pigs from Yushipan are processed and sold to 7 Dealers.
- The seven dealers are in Thimphu, Paro, Mongol, Phuetsuholing, and Phuetsuholing. Two big dealers are from Thimphu, and the rest are small dealers.
- Eggs are delivered from Sarpang Layer at a rate of 234 Cartons× 210pcs per week.
- Originally, the idea was to sell products to small dealers and at the same time have them utilize the freezer in Thimphu city (to support the small dealers), but the small dealers did not have the financial resources, and the volume of transactions was extremely small, so the freezer warehouse was not fully utilized.
- Therefore, BLDCL's asset, a store facility with freezer (Business Center of Thimphu), was rented to a major dealer (rent=Nu.92,500/mo.). The contract term is from March 1, 2024, to February 30, 2026 (2 years).
- Since all of the Dealer's stores are located within a 1km radius of the Business Center of Thimphu, it can be assumed that if interviews on Consumer Preference Survey can be conducted in the central Thimphu area. It is assumed that the stores where the consumers are shopping are almost all LPVAD's contracted dealers.
- Wholesale price to Dealer as known by Market Distribution Unit of BLDCL: Pork Nu..435/kg (to major players), Nu.450/kg (to small Deaker). Sales to large 2-Dealers: 4.5 mil. product/month, sales to small 2-Dealers: 1.3 mil. product/month.
- Trout: Nu.750/kg according to BLDCL Sales Audit; bait is Fish Pellet imported from Germany; shipping value to Dealer Nu.515/kg -> retail value about Nu.550/kg. 1kg: 2-3pcs for large fish, 4-5pcs for small fish.

Ⅰ. Face： Name of Respondents_____ Age_____

Face Item	Information on Respondent
Living Place	Address ( )
How many minutes did it take to reach Thimphu Central Market?	(_____) minutes
Number of family members	(_____) persons
Average monthly income ※Rough figure is good enough	Nu. ( )
Percentage of self-sufficiency in crops and livestock (approx.)	Crops Nu. ( ) Meat Nu. ( ) Fish Nu. ( )
Are you producing rice by yourself?	Variety:_____: ___kg/year
Are you producing vegetables and fruits by yourself? If "yes""; ※That is equivalent to;	variety: _____, _____; _____% of total consumption
Are you producing meat (pork, chicken, Beef, fish) by yourself? If "Yes";	Kind: _____, _____; _____ heads/year
Are you producing egg by yourself? If "yes";	(_____pcs/day)

Ⅱ. Questions on meat and fish buying

Q1: Image of Local meat (BLDC) and Fish compared to imported products (India and Thailand).

Index	Your Impression on BLDC (Local) Product compared to Imported One		
Price	More Expensive ( )	Lower ( )	Same ( )
Safetyness	More safe ( )	More Dangerous ( )	Same ( )
Freshness	More Fresh ( )	Less Fresh and old ( )	Same ( )
Taste	Better than Imported ( )	Better than Local one ( )	Same ( )

Q2: How often do you buy the following items? How much do you spend at a time by family?

Item	Kg per buying (kg/time)	Frequency in a month (times)	Spending in a month (kg/month)	% of imported product (%)
Chicken				
Pork				
Beef				
Bacon				
Sausage				
Fish (type____)				

Q3: What is the price range per kg of the following products that you buy most often? And how much would you refrain from buying each item if the price of each item increased too?

Item	Often buying price range (Nu./Kg)	Refraining price (Nu./kg)
Chicken	( ) ～ ( )	( )
Pork	( ) ～ ( )	( )
Beef	( ) ～ ( )	( )
Bacon	( ) ～ ( )	( )
Sausage	( ) ～ ( )	( )
Fish (_____)	( ) ～ ( )	( )

Q4: Would you prefer to buy hygienic & safe meat at a slightly higher price than imported?

i. Yes ii. No iii. Maybe

Ⅲ. Questions on BLDCL Products

Q1. What are the advantages of BLDC's meat over those imported?

Safety	Freshness and taste	Better Shelf-life	Accessibility	Availability
( )	( )	( )	( )	( )

Q2. Suppose the price is 15-20% higher than imported meat and fish, would you still buy BLDC product? What is the reason for this?

Item	Yes/No	Reasons
Chicken		
Pork		
Beef		
Bacon		
Sausage		
Trout		

Q3. How much you usually pay to buy 1 kilo gram of meat? If there was a price difference between Indian imports and domestic (BLDC) products, by how much would you buy Indian products?

Item	Your usual buying price (Nu./kg)	Alternative price of imported meat (Nu./kg)
Chicken	Nu._____ /Kg	Nu._____ /Kg
Pork	Nu._____ /Kg	Nu._____ /Kg
Beef	Nu._____ /Kg	Nu._____ /Kg
Bacon	Nu._____ /Kg	Nu._____ /Kg
Sausage	Nu._____ /Kg	Nu._____ /Kg
Trout	Nu._____ /Kg	Nu._____ /Kg

Ⅳ. Questions on Processed Meat Products

Q1. From where did you get information about processed meat products?

Newspapers	Television	Social networks	Outdoor advertisement	Through friends and relatives
( )	( )	( )	( )	( )

Q2. Do you know anything about processed meat or value-added meat?

Yes ( ) No ( ) Maybe ( )

Q2.1 If yes, What are the processed meat/fish products that you know of?

Meat Item	Yes	No	Your experience to eat in Bhutan	Ranking ※
Pork Ham			Yes ( ) No( )	
Pork Bacon			Yes ( ) No( )	
Pork Frankfurter sausages			Yes ( ) No( )	
Pork Local sausage			Yes ( ) No( )	
Pork Fresh Cuts			Yes ( ) No( )	
Chicken Frankfurter sausage			Yes ( ) No( )	
Chicken Local Sausage			Yes ( ) No( )	
Chicken Fresh cuts			Yes ( ) No( )	
Beef Minced			Yes ( ) No( )	
Beef Sausage			Yes ( ) No( )	
Others (Specify)			Yes ( ) No( )	

※ Rank top 3 you love

Fish Item	Yes	No	Your experience to eat in Bhutan	Ranking ※
Salted/dried fish (Species; _____)			Yes ( ) No( )	
Smoked Fish (Species; _____)			Yes ( ) No( )	
Canned Fish (Species; _____)			Yes ( ) No( )	
Fish ball/paste			Yes ( ) No( )	
Others ( )			Yes ( ) No( )	

※ Mark best you love

Q3. What encourages you to buy processed meat products?

Cheaper	Safety	Better Shelf-life	Accessibility	Availability	Quality
( )	( )	( )	( )	( )	( )

Q4. What factors discourage you from buying processed meat products?

Expensive	No safety	Doubtful of composition	Unavailability	Health issue
( )	( )	( )	( )	( )

Q.5 Do you encourage your children to eat processed meat?

i. Yes ii. No (why? _____)

Q.6 Where do you buy processed meat?

Meat shop	Supermarket	BDCL Outlet	Others (Specify)
( )	( )	( )	( )

Q.7 What feeling do you have in general terms with locally processed meat?

Q.8 Do you think that you should support locally processed meat?

Yes ( )	No ( ) Why? ( )	Neutral ( )

Q.9 What is your opinion towards the future processed meat consumption in Bhutan?

Increase ( ) Decrease ( ) No Idea ( )

Ⅴ. Social survey on trout supply and consumption (hotels and restaurants only)

Q1. Frequency of serving trout on the menu and KG cooked per day; Approx. ( ) times/day

Q2. Location of buying trout and kilo grams or pieces of trout procured per purchase.

Location: _____	Amount of per purchase: _____ (kg or pcs)

Q3. What form of trout do you procure? (fresh or frozen)

Q3.1: Which of the following forms of procurement do you use? Mark ↓

Round (with no modification)	Semi-dressed (with head but gills and entrails removed)	Dressed (head, guts and gills removed)	Fillet (head removed and meat cut into 3 pieces)

Q3.2：Which size of trout do you prefer to use to cook? Mark ↓

under 125gram	125-250gram	250-350gram	350gram and above

Attachment: PowerPoint presentation and report prepared by Bhutanese consultant

Attachment： PowerPoint presentation and report prepared by Bhutanese consultant

Report on Consumer Preference Survey

September 20 (Fri), 2024

Kherig Consultancy Center/ Tshewang Jurmi

Context of the Survey

- Period of Survey : June 2024 — September, 2024
- Walk in Interview to respondents
- Venue : BLDCL outlet (Thimphu) 20 Respondents
- Working place etc 36 Respondents
  5star-hotel（2 Places), 3&4 star-hotel (2 Places), 2 star and below/restaurants (6 Places)
- Implemented agency: Kherig Consultancy Centre/ Mr. Tshewang Jurmi. (Contact:+975-1714-7474)
- No. of interviewers participated: 6

3

II. Questions on meat and fish buying

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Q1. Image of local meat (BLDCL) & Fish compared to imported products (India and Thailand)

Freshness	Less fresh and old	23.2%
	More fresh	32.1%
	Same	44.6%
Price	Lower	51.8%
	More expensive	21.4%
	Same	26.8%
Saftetyness	More Dangerous	7.1%
	More safe	75.0%
	Same	17.9%
Taste	Better than imported	39.3%
	Better than local one	5.4%
	Same	55.4%

12

Q2. How often do you buy and how much do you spend at a time (family)?

	Kg per buying (kg/time)			Frequency in a month (times)			Spending in month (kg/month)			% of imported products (%)		
Items	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
Chicken	1.580	5	0	2.786	7	0	3.946	13	0	60.250	100	0
Pork	1.241	10	0	1.750	5	0	2.446	18	0	61.696	100	0
Beef	1.473	10	0	1.873	5	0	2.589	10	0	57.143	100	0
Bacon	0.571	10	0	0.321	5	0	1.554	45	0	6.250	100	0
Sausage	1.107	11	0	1.500	6	0	2.321	25	0	16.071	100	0
Fish(type)	0.955	6	0	1.321	6	0	1.818	6	0	34.821	100	0

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Q3. Price range per kg that is bought often

Items	Avg_Nu	Max_Nu	Min_Nu
Chicken_Min	325.000	450	200
Chicken_Max	391.964	500	350
Pork_Min	445.370	550	300
Pork_Max	570.185	650	450
Beef_Min	422.222	500	300
Beef_Max	555.556	650	400
Bacon_Min	292.143	350	200
Bacon_Max	363.214	400	250
Sausage_Min	275.400	400	200
Sausage_Max	340.000	500	250
Fish(type)_Min	376.607	800	250
Fish(type)_Max	460.000	800	250

17

Q3. Refraining from buying prices of each item increased to!

Items	Avg	Max	Min
Chicken	**490.714**	**800**	**300**
Pork	**668.704**	**1100**	**400**
Beef	**672.727**	**1000**	**450**
Bacon	**398.810**	**600**	**200**
Sausage	**400.000**	**700**	**200**
Fish(type)	**535.091**	**1000**	**300**

18

III. Questions on BLDCL prodcts

20

Q1. What are the advantages of BLDCL's meat over those imported

Items	0 - 300,000	300,001 - 400,000	400,001 - 650,000	650,001 - 1,000,000	1,000,001 and above	Grand Total
Accessibility	18.18%	10.00%	16.67%	7.41%	11.11%	13.27%
Availability	22.73%	20.00%	16.67%	7.41%	5.56%	14.16%
Better shelf-life	4.55%	20.00%	13.89%	14.81%	11.11%	12.39%
Freshness and taste	22.73%	10.00%	22.22%	29.63%	27.78%	23.89%
Safety	31.82%	40.00%	30.56%	40.74%	44.44%	36.28%
Grand Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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Q2. Whether you will buy if price are higher by 15-20% and why?

Items	Yes	No	Reason (yes/[NO])
Chicken	69.03%	30.97%	Hygiene, Access, Promote Local, Fresh, Tasty, Safe
Pork	38.94%	61.06%	Safe, Fresh, Hygiene, Promote local, trust, taste[due to disease]
Beef	49.56%	50.44%	Fresh, tase, access, safe, healthy, tasty, promote local, trust
Bacon	29.20%	70.80%	Healthy, safe, not available in country, promote local
Sausage	30.97%	69.03%	Promote local, hygiene, safe, trusted, taste, fresh
Fish Trout	46.02%	53.98%	No imported trout, local, safe, tasty, hygiene, promote local

Q3. How much you usually pay to buy 1 Kg of meat?

Descriptive stats	Chicken	Pork	Beef	Bacon	Sausage
Mean	379.3805	493.6697	466.1062	328.6364	310.9
Median	350	500	450	345	300
Mode	350	550	450	300	350
Standard Deviation	44.68707	59.62321	41.75681	49.47847	55.17822
Range	200	200	250	200	200
Minimum	300	400	350	200	200
Maximum	500	600	600	400	400

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Q3. Alternative price of imported 1 Kg of meat?

Descriptive stats	Chicken	Pork	Beef	Bacon	Sausage
Mean	352.08	445.05	425.22	295.74	259.20
Median	350	450	400	300	300
Mode	350	500	400	300	300
Standard Deviation	60.76	74.59	57.65	55.12	82.20
Range	485	350	300	250	300
Minimum	250	300	300	150	100
Maximum	735	650	600	400	400

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IV. Questions on Processed meat products

26

Q1. Information about processed meat products?

Row Labels	0 - 300,000	300,001 - 400,000	400,001 - 650,000	650,001 - 1,000,000	1,000,001 and above	Grand Total
Newspapers	0.00%	0.00%	0.00%	7.20%	12.66%	3.74%
Outdoor advertisement	4.15%	0.00%	17.57%	9.20%	5.06%	9.05%
Social networks	45.62%	41.67%	34.46%	39.60%	38.61%	39.43%
Television	17.51%	12.50%	19.59%	8.80%	12.66%	14.75%
Through friends and relatives	32.72%	45.83%	28.38%	35.20%	31.01%	33.04%
Grand Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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Q2. Knowledge on processed meat or value-added meat?

Row Labels	0 - 300,000	300,001 - 400,000	400,001 - 650,000	650,001 - 1,000,000	1,000,001 and above	Grand Total
Maybe	1.38%	25.00%	10.14%	19.20%	7.59%	11.50%
No	18.43%	25.00%	10.14%	5.60%	0.00%	10.62%
Yes	80.18%	50.00%	79.73%	75.20%	92.41%	77.88%
Grand Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

28

Q3. Motivation to buy processed meat products?

Factors motivating	0 - 300,000	300,001 - 400,000	400,001 - 650,000	650,001 - 1,000,000	1,000,001 and above	Grand Total
Accessibility	15.21%	0.00%	21.28%	5.60%	2.53%	11.21%
Availability	20.74%	20.83%	24.32%	20.00%	5.70%	19.27%
Better Shelf-life	3.69%	0.00%	12.50%	7.20%	18.35%	9.05%
Cheaper	15.21%	20.83%	11.15%	12.00%	2.53%	11.80%
Quality	21.20%	27.08%	16.22%	18.40%	34.18%	21.63%
Safety	23.96%	31.25%	14.53%	36.80%	36.71%	27.04%
Grand Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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Q4. Factors discouraging from buying processed meat products?

Discouraging factors	0 - 300,000	300,001 - 400,000	400,001 - 650,000	650,001 - 1,000,000	1,000,001 and above	Grand Total
Doubtful of composition	45.62%	27.08%	47.30%	49.60%	15.19%	40.61%
Expensive	12.90%	25.00%	10.14%	11.20%	18.99%	13.77%
Health issues	17.51%	0.00%	20.27%	21.60%	15.19%	17.31%
No safety	5.53%	20.83%	4.05%	0.00%	0.00%	4.33%
Unavailability	18.43%	27.08%	18.24%	17.60%	50.63%	23.99%
Grand Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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IV. Questions on Processed meat products

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Q5. Encouraging children to eat processed meat?

Row Labels	Respondent No
No	37.5%
Health concerns	2
Health issues	2
Health reason	1
Not healthy	2
Not safe	1
Safety concerns	1
Unhealthy	10
Doubtful composition	2
Yes	62.5%
(blank)	35
Grand Total	56

Q6. Buy Processed meat from?

Store type	0 - 300,000	300,001 - 400,000	400,001 - 650,000	650,001 - 1,000,000	1,000,001 and above	Grand Total
BLDCL outlet	45.16%	33.33%	39.19%	39.20%	41.14%	40.22%
Meat shop	13.36%	27.08%	26.01%	31.20%	27.85%	24.98%
Others	3.69%	8.33%	2.70%	0.00%	11.39%	4.13%
Supermarket	37.79%	31.25%	32.09%	29.60%	19.62%	30.68%
Grand Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Q7. Feeling about locally processed meat

Common comments	Response No
Healthy	11
Safe	10
Fresh	10
Quality	7
Tasty	6
Good	5
Hygiene	4
Trust	4
Natural	1

Unique comments	No
Need improvement	3
Good but need to improve	2
Quality better than other process meat	1
Improve flavor and taste	1
Lack of certification	1
Cheap and unhealthy	1
Not certain of safety and quality is not consistent	1
Promote local by making price competitive with imported	1
Have to improve quality	1
Comfortable to consume compared to imported	1
Better than imported	1
Clean and organic	1

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Q9. Opinion towards future processed meat consumption in Bhutan

Row Labels	No of Respondent	Percent
Decrease	5	9%
Increase	35	63%
No Idea	16	29%
Grand Total	56	100%

36

V. Social survey on trout supply and consumption (hotels and restaurants only)

37

5 star above

Name	Frequency of serving per day (kg)	Location	KG per purchase & Type		Forms of procurement do you use?	Size of trout do you prefer to use to cook?
Aman	0.25	BLDC Outlets	0.8	Frozen	Semi-dressed (with head but gills and entrails removed)	125-250 gm
Pemako	0.5	BLDC Outlets	0.8	Frozen	Semi-dressed (with head but gills and entrails removed)	<125 gm

38

3 & 4 star above

Name	Frequency of serving per day (kg)	Location	KG per purchase & Type		Forms of procurement do you use?	Size of trout do you prefer to use to cook?
Lemon Tree hotel	10	My mart shop	40	Frozen	Fillet	350gm and above
Hotel Dralha	4	My mart shop	15	Frozen	Semi-dressed (with head but gills and entrails removed)	250 to 350gm

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2 star & below

Name	Frequency of serving per day (kg)	Location	KG per purchase & Type		Forms of procurement do you use?	Size of trout do you prefer to use to cook?
Karma's Daba	10	Main town meat shop	30	Frozen	Fillet	350gm and above
Jojo's kitchen	5	Olakha meat shop	20	Frozen	Semi-dressed (with head but gills and entrails removed)	350gm and above
Black out	1	Main town meat shop	8	Frozen	Fillet	350gm and above
Lingkhin Restaurant	5	Olakha	40	Frozen	Fillet	350gm and above
Harmony	6	Main town meat shop	15	Frozen	Fillet	350gm and above
The Black sheep	6	Main town meat shop	30	Frozen	Fillet	350gm and above

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Thank you

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Attachment: Prepared by JICA Survey Team_Purpose of the above report (PPT)

Attachment：Prepared by JICA Survey Team_Purpose of the above report (PPT)

"Consumer Preference Survey" Review (1)

1. Meat and fish from BLDCL are seen as **"cheap and safe".**
2. 1.5kg of meat and 1kg of fish are purchased in one shopping trip. Consumption per month is 4kg of chicken, 2.5kg of pork, 1.5kg of bacon, 2.5kg of sausage, and 2kg of fish per household. **Consumer prefer locally prepared bacon and sausages** (94% and 84% respectively)
3. The price of chicken is Nu.500/kg, pork Nu.700/kg, beef Nu.700/kg, bacon Nu.400/450g, sausage Nu.400/450g, and fish Nu.550/kg.
4. All the income groups feel that there are **NO particular advantages** to BLDCL meat, but if they had to choose one, it would be **"safety"**.
5. Bacon and sausage are the products that people will be **most reluctant to buy if prices go up by 15-20%**. Chicken is almost like a staple food, so people can't hold back on buying it, and trout has no import substitution, so people will just have to buy it.
6. The overwhelming majority of people obtain product information from SNS or oral communication from friends and relatives.

"Consumer Preference Survey" Review (2)

7. Those in the lowest income stratum (young people?) and those in the highest income stratum (intellectuals?) have a lot of product knowledge. It is thought that the former gain their knowledge from the internet, while the latter gain theirs from experiential knowledge.
8. **Low price is not a strong motivator**, with only around 11% of respondents citing it. Quality and safety are more important.
9. More people lose interest in a product **because it is "unavailable" than because of its price**. This is true for all income strata.
10. Around 65% of people recommend that children eat processed meat, and it is thought that ensuring safety is a social responsibility for BLDCL.
11. Younger people are less particular about local produce.
12. It is thought that the data for all but Aman and Pemako is not for Trout. **Even at 5-star hotels, the use of Trout is still extremely low**.

APPENDIX 6 PRICE GUARANTEE SYSTEM FOR LIVESTOCK PRODUCTS IN JAPAN

6.1 Outline

Japan has a low self-sufficiency rate for agricultural products, and the same is true for meat, which is currently dependent on imports. Under these circumstances, the Agriculture and Livestock Industries Corporation (ALIC) has played an extremely important role in the importation of meat in Japan. Beef and pork imports in Japan have been handled by the ALIC This is because imported beef and pork are supplied to the market as a complement to domestically produced beef and pork.

On the other hand, the price stabilization system requires consumers to purchase at a price that deviates from the supply-demand equilibrium price, and the difference between the two results in an economic loss.

6.2 Changes in the Price Stability System for Livestock Products in Japan

The price guarantee system for livestock products in Japan is an important policy that has been established to protect the domestic livestock industry and stabilize prices. Its evolution can be summarized chronologically as follows.

6.2.1 Post-war reconstruction period (late 1940s - 1950s)

After World War II, Japan's agriculture and livestock industries were exhausted, and there were particular problems with a shortage of livestock products (beef, pork, dairy products, etc.) and unstable prices. During this period, policies were needed to stabilise the supply of livestock products and resolve the food shortage.

Main measures:

Price control policy: Immediately after the war, the government strictly controlled the guaranteed with the aim of achieving a stable supply of food.

6.2.2 Period of economic growth (1960s - 1970s)

As Japan achieved rapid economic growth, demand for livestock products increased rapidly, and prices soared. In particular, as consumption increased in urban areas, there was a growing need for stable supply. During this period, price guarantee policies evolved to increase the competitiveness of the livestock industry while reducing the burden on consumers.

Main measures:

Livestock Industry Promotion Corporation Act (1974): The Livestock Industry Promotion Corporation (now the ALIC) was established to support the development of the livestock industry and to stabilize prices. The Corporation played a role in balancing supply and demand for livestock products and contributed to stabilizing prices.

Supply and demand adjustment and price support policies: In order to prevent large fluctuations in prices, supply and demand adjustments were implemented, and the development of distribution networks through agricultural cooperatives (Japan Agricultural Cooperative: JA) and other organizations progressed.

6.2.3 Impact of trade liberalization (1980s - 1990s)

In the 1980s, the trend towards international trade liberalization strengthened, and Japan also needed to respond to this. In particular, the liberalization of beef and orange imports in 1988 and the Uruguay Round agreement in 1995 had a significant impact on the domestic livestock industry.

Main measures:

Livestock Industry Stabilization Measures (from the late 1980s): In preparation for the sharp price falls that accompanied liberalization, subsidies and price compensation systems were put in place for livestock farmers. In particular, a certain price guarantee was put in place to prevent the sharp price falls that accompanied liberalization.

Measures to Stabilize Beef Cattle Farming (1987-): In order to respond to the liberalization of beef imports, measures were taken to stabilize the business of beef cattle farmers, and subsidies were put in place to support the price of domestic beef, as well as relief measures in the event of a price drop.

6.2.4 Modern times (2000s to present)

Since the 2000s, the environment surrounding the livestock industry has become more complex, due to changes in domestic consumer needs, strengthening international competitiveness, and responses to environmental issues. Policies to stabilize livestock product prices, which are easily affected by trends in domestic and international markets, are continuing, but are changing to become more flexible and sustainable systems.

Main measures:

Livestock Industry Stabilization System (from 2007): The ALIC has taken the lead in introducing measures to stabilize prices and reduce business risks in response to sudden fluctuations in livestock product prices. This includes subsidies and insurance systems to help farmers maintain a certain level of production.

Dealing with the WTO and FTAs: In order to deal with multilateral trade agreements and free trade agreements (FTAs), support measures to improve the competitiveness of the domestic livestock industry have been strengthened, and the branding and quality improvement of domestic products to compete with imported products is being promoted.

6.2.5 Future Issues and Prospects

Reducing environmental impact: In order to ensure the sustainability of the livestock industry, consideration for environmental conservation is required, and policies to reduce environmental impact, such as reducing greenhouse gases and properly managing livestock waste, will be further strengthened in the future.

Food safety and quality assurance: In response to the growing safety-consciousness and interest in quality among consumers, efforts are being made to improve the traceability (traceability of production history) of domestic livestock products and to comply with international quality standards.

6.3 Background to the abolition of the meat price stabilization program from December 2018

The abolition of the pork price stabilization program (price difference compensation system) in December 2018 was due to the impact of WTO trade rules, free trade agreements, changes in the domestic market, and a shift in agricultural policy. As a result, domestic pig farmers have moved away from relying on traditional price compensation and towards a more comprehensive business risk management framework. As trade liberalization progressed, the Japanese pig farming industry was required to respond to the new competitive environment, and this was one of the factors that prompted the change in policy.

The background to the abolition is as follows.

6.3.1 Changes in international trade rules and the WTO agreement

Consistency with the rules of the WTO : The pork price stabilization program functioned as a subsidy system to protect the domestic market. However, such policies to protect domestic industries could potentially violate international trade rules. In particular, the WTO's Agreement on Agriculture required that trade-distorting subsidies and price support measures be phased out.

In accordance with the Uruguay Round Agreement (1995), agricultural protection measures were being reviewed, and this had an impact on the termination of the pork price stabilization program. As Japan moved towards the liberalization of international trade, it was forced to review its domestic agricultural price compensation and subsidy policies.

6.3.2 Impact of FTA and Economic Partnership Agreements (EPA)

Impact of the Trans-Pacific Partnership (TPP) and EPA: Japan has been actively promoting free trade agreements and EPA in recent years, which have led to a reduction in tariffs and the relaxation of import restrictions. In particular, the protection of imported pork has been reduced under the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the Japan-EU EPA, and it has become necessary to restructure the domestic price stabilization policy. These trade agreements have made the traditional programs for adjusting prices in the domestic market redundant and their role has diminished.

6.3.3 Structural changes in the domestic market

Changes in domestic consumer demand: The pork market is changing due to the diversification of consumer diets and the increased demand for cheaper imported products over domestic products. In particular, the effectiveness of the compensation system for stabilizing domestic prices has diminished as imported pork has come to account for a large share of the market.

Structural changes on the producer side: The increased scale of operations and technological advances of pig farmers have improved production efficiency and made them more resilient to price fluctuations. As a result, the number of pig farmers able to respond to market competition without relying on price stabilization program has increased.

6.3.4 Policy shift: shift to business stability measures

Shifting from price stability to business stability: With the abolition of the pork price stabilization program, the focus shifted from policies that directly respond to price fluctuations to business stability measures that aim to manage a wider range of risks. This includes measures to respond to risks such as natural disasters and epidemics, in addition to price fluctuations and market risks. Agricultural insurance and subsidy systems have been developed, and there is now an emphasis on mechanisms that reduce overall business risks, not just price fluctuations in the pork market.

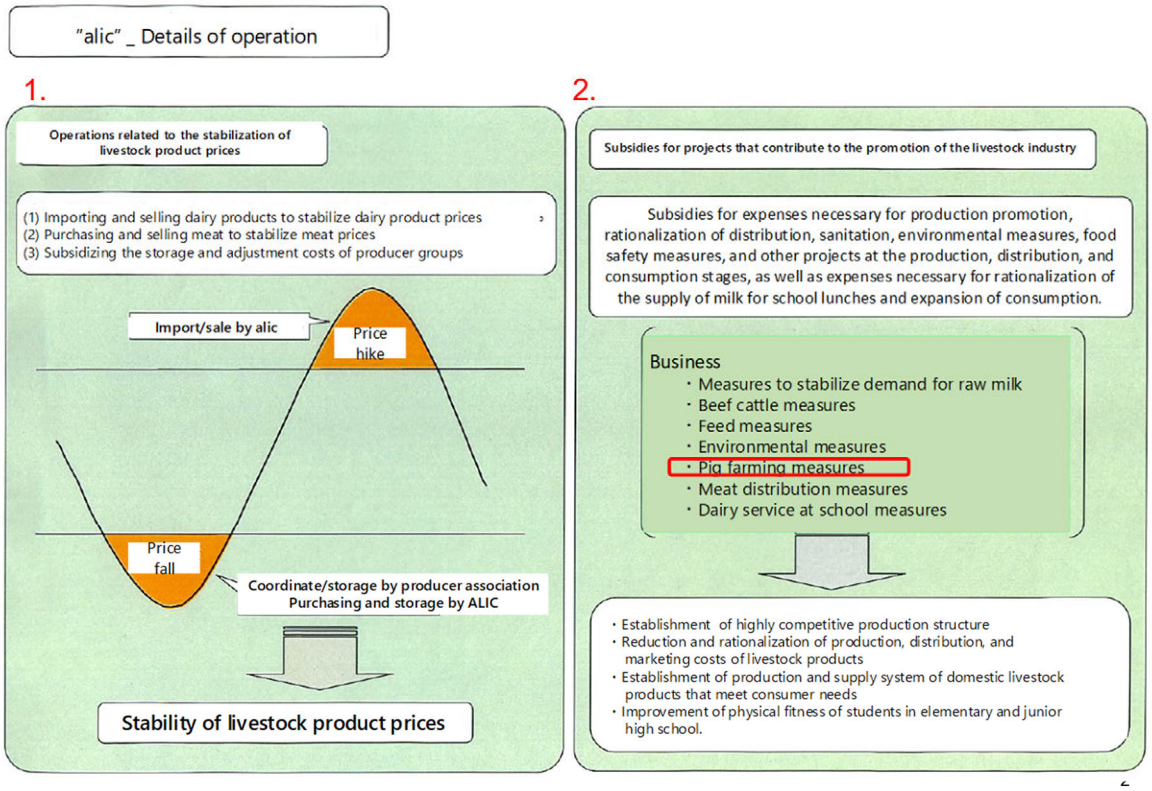
6.4 Details of the Meat Price Stabilization Program until December 2018

The meat price stabilization system stabilities wholesale prices within a stable price range through the supply and demand operations by the ALIC[2], thereby preventing price volatility and ensuring a stable supply of meat to consumers, while contributing to the business stability of producers (see Figure 6-1 in the next page). Please note that the designated meat (beef and pork) price stabilization program was abolished on December 30, 2018.

(Before 2018) The differential tariff system for pork works in such a way that when the price of imported goods is low, the portion that falls short of the standard import price is collected as a tariff to protect domestic pig farmers, while when the price is high, a low ad valorem tax is applied to reduce

[2] https://www.alic.go.jp/english/index.html This policy is endorsed by Act Concerning the Stabilization of Price of Livestock Products (Act.183, 1961)

the tariff burden and benefit consumers. This system was important in striking a balance between consumers and domestic producers.

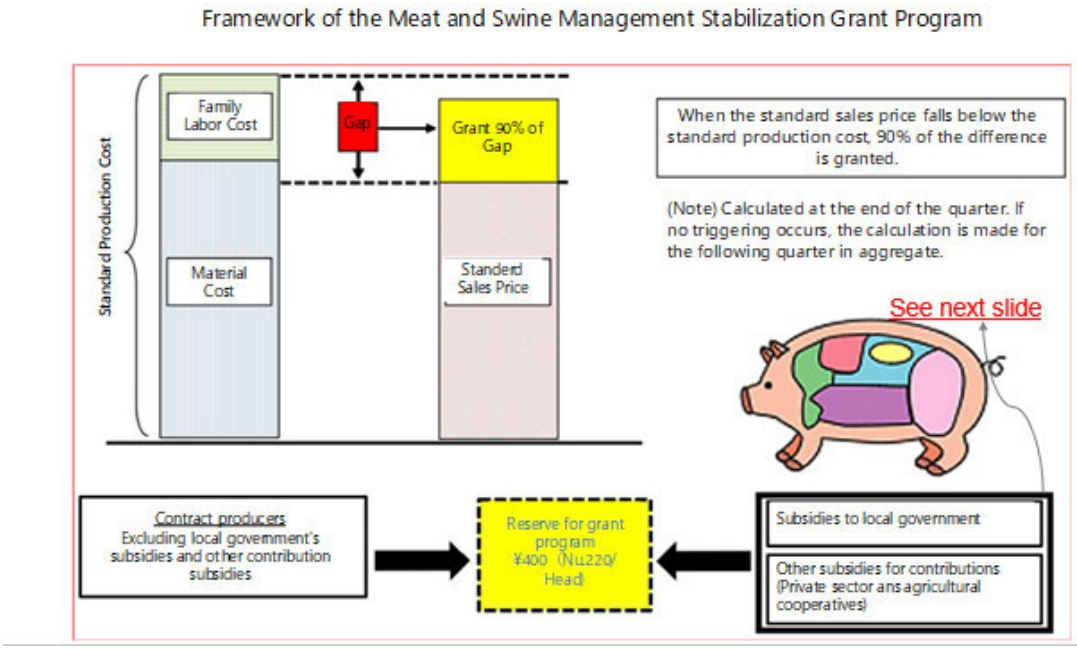


Source: ALIC

Figure 6-1 Mechanism of Meat Proce Stabilization Program

How the System Works?

- Every quarter, the standard sales price (gross revenue) and standard production costs (production costs) are calculated[3], and if the standard sales price falls below the standard production costs, 90% of the difference is paid out as a subsidy (refer to Figure 6-2 in the succeeding page).



Source: JICA Survey Team

Figure 6-2 Framework of the Meat and Swine Management Stabilization Grant Program

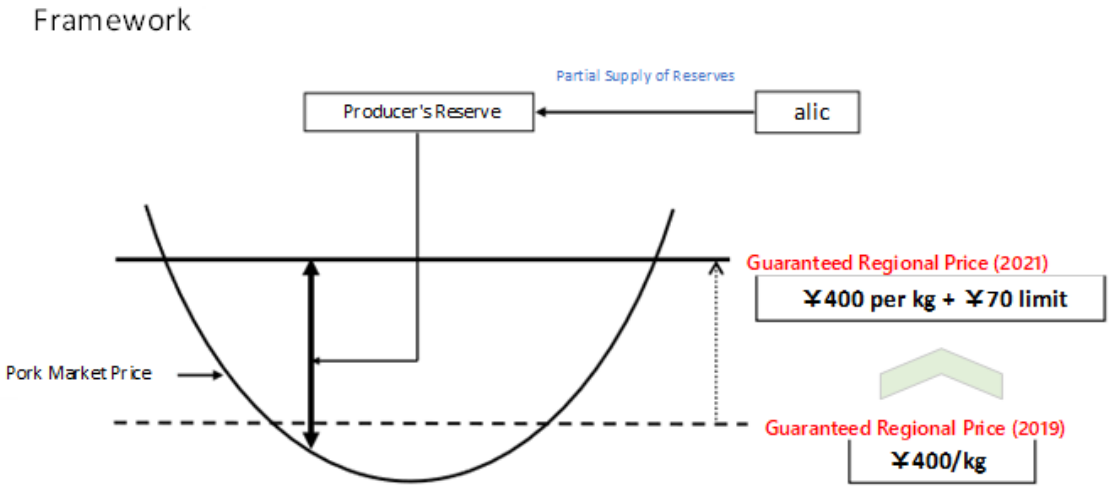
In addition, the amount equivalent to one quarter of the subsidy amount is paid from the "reserve fund" accumulated through the contributions paid to the organization by pork producers. The remaining amount equivalent to three quarters (government funds) is paid by the organization (ALIC) as the amount paid as "subsidy".

- This price stabilization system limited the amount of beef and pork imports and guaranteed farmers' income by stabilizing prices, thereby stabilizing meat production.

As a result of the TPP Agreement negotiations, a long-term tariff reduction period was secured for pork, and the current differential tariff system was basically maintained, while a safeguard measure was established. Specifically, the tariff rate (currently: 482 yen/kg for the ad valorem tax and 4.3% for the specific duty) will be reduced to 125 yen/kg for the ad valorem tax and 2.2% for the specific duty when the TPP agreement comes into effect, and then over the next 10 years the ad valorem tax will be reduced to 50 yen/kg and the specific duty will be abolished (see Figure 6-3 for comparison).

The image of the tax rates and the standard quantities at which safeguards are triggered for the ad valorem and specific duties are shown in Figure 6-3.

[3] This is calculated at the end of each quarter, and if there is no subsidy payment in that quarter, it will be calculated cumulatively in the next quarter within the same fiscal year.



Source: ALIC

Figure 6-3 Safeguard Mechanism of Pork Meat

At present, the following programs are being implemented.

- Compensation Price Support Program for Producers of Milk for Manufacturing Use
- Compensation Price Support Program for Producers of Beef Calves
- Management Stability Program for Egg Producers

Under this program, producers voluntarily accumulate funds on a prefectural basis, and when hog prices drop, the funds are withdrawn to compensate subscribers for the difference from the regionally guaranteed price.

Starting in 2008, when the Regional Guarantee Price is raised in response to a sharp rise in the price of formula feed, a portion of the reserve fund is subsidized by the ALIC.

By introducing this program to livestock farmers and promoting their participation, the ALIC aims to ensure a stable supply of meat pigs and the stable development of their business.