Islamic Republic of Pakistan
Government of Sindh
Livestock and Fisheries Department

Project on Sustainable Livestock Development for Rural Sindh in the Islamic Republic of Pakistan

Project Completion Report

August 2021

Japan International Cooperation Agency

Kaihatsu Management Consulting, Inc.

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Project on Sustainable Livestock Development for Rural Sindh
in the Islamic Republic of Pakistan
Project Completion Report

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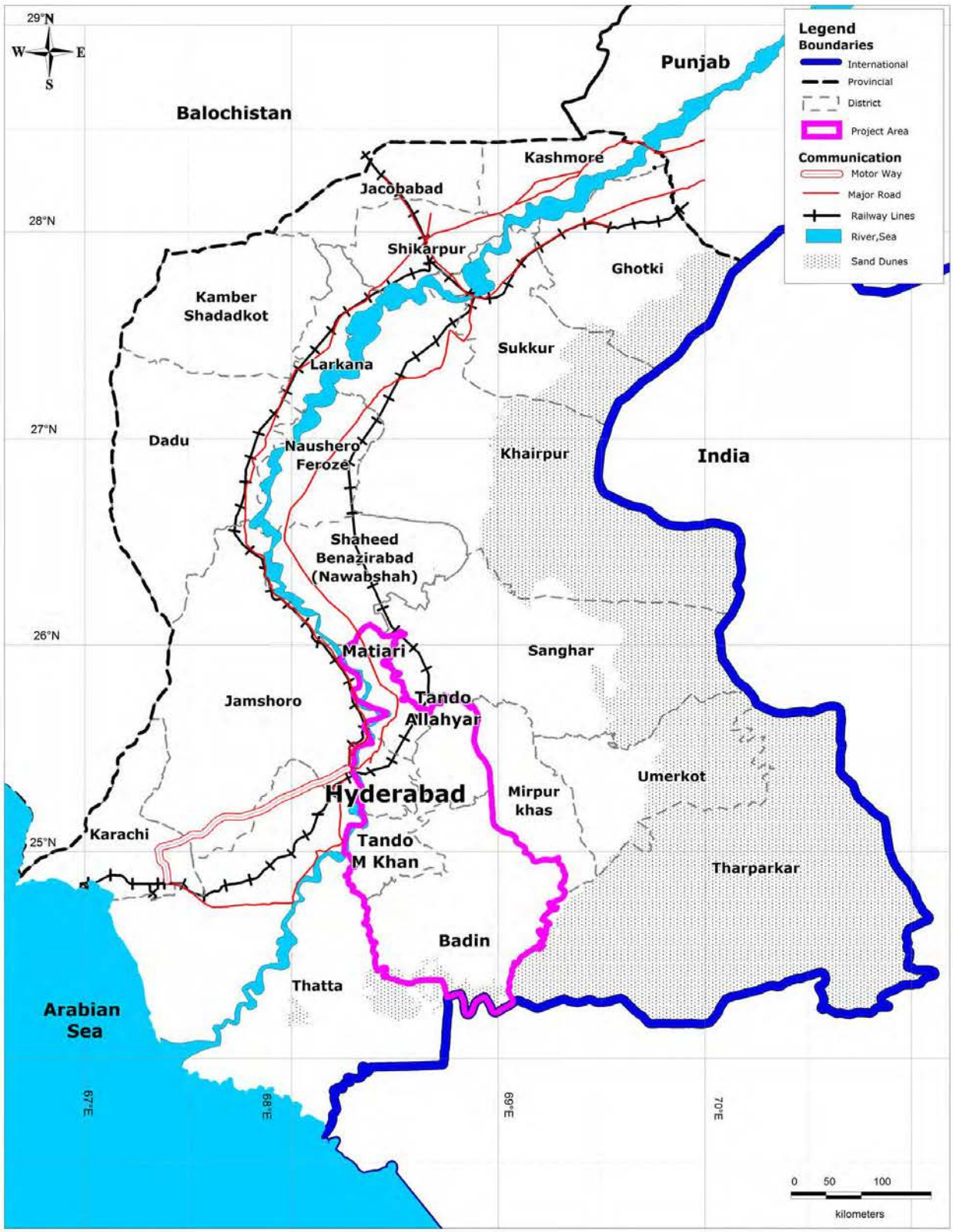


DIRECTORATE GENERAL LIVESTOCK
Sindh-Hyderabad

JICA Project Team:

Kaihatsu Management Consulting, Inc.

Prepared By:
Exponent Engineers (Pvt.) Ltd

The Project on Sustainable Livestock Development for Rural Sindh

Project Location Map

JICA

Sindh Livestock Photo Gallery

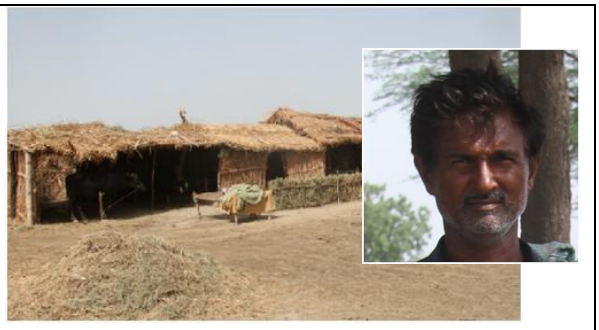
Bathing buffaloes

A female farmer is carrying a haylage (banana leaves) (back)

Pregnant buffalo herd (at the old cattle colony)

Milking (at the new cattle colony)

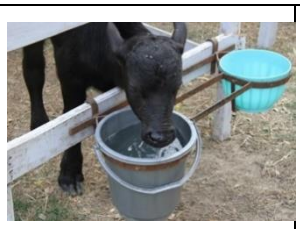
A P/F, Mr. Asif (Matiari District)



A P/F, Mr. Pehlaj, and his residence (Hyderabad District)

An interview to the 2nd group P/Fs

	
A paddock made of single pipes (P/F)	A milking trough made of single pipes (P/F)

			
September: Ear-tagging (P/F)	October: Providing milk to calves (calf center)	November: Free access to water	December: Dry hay provision (calf center)
Dairy Farm Record Calendar examples			

	
Milking shed (P/F)	A partition and a concrete floor of a milking shed (P/F)

	
Tsubogari sampling of Egyptian clover	Technical guidance on hay preparation (P/F)

	
Reproductive function diagnosis of a male buffalo (P/F)	Collecting semen by electircal stimulation (breeder)

	
Teat massage before measuring milk production (breeder)	An inspector is measuring milk production (breeder)

	
Preparing milk fat analysis (mini-laboratory)	Technical guidance on how to use equipment (mini-laboratory)

	
Technical guidance on how to wash crude fiber (PRI)	Laboratory (PRI)

	
A calf distributed to a farmer	Feeding management

	
2-day-old calf (calf center)	A calf is distributed to a P/F at the age of 35 days old

Fixed type calf hatches (Relocated calf center)

	
A Japanese mission's visit to the calf center	The distributed buffalo gave birth to a male calf

Witten exam for extension team M/T applicants (Livestock Department)

A W/S for female farmers

A W/S for male farmers

Social mapping for the entire village

Developing a diagram for female farmers

An extension team vehicle (old design)

The project name and a logo

An extension team vehicle (new design)

	
Social mobilization training	A game exercise during CBU team building training

	
SWOT analysis during CBS development training	Project management training delivered by M/Ts

	
Development of a consolidated action plan training	Development of a consolidated action plan training (a recourse person on the right)

	
C/P meeting on July 9, 2020. Everyone is wearing masks.	

Abbreviations

Abbreviation	Original Term
ADF	Acid Detergent Fiber
ADP	Annual Development Plan
Alb	Albumin
ASLP	Agriculture Sector Linkage Program
AU	Animal Unit
BBSYDP	Benazir Bhutto Shaeed Youth Development Programme
BCS	Body Condition Score
BMRF	Breeder Milking Record File
BOI	Board of Investment
BUN	Blood Urea Nitrogen
CBS	Capacity Building Strategy
CBU	Capacity Building Unit
CIDR	Controlled Internal Drug Release
C/M	Chief Minister
COVID-19	Coronavirus Disease of 2019
CP	Crude Protein
C/P	Counterpart
C/S	Chief Secretary
CVDL	Central Veterinary Diagnosis Laboratory
DAE	Department of Agricultural Extension
DG	Daily Gain
D/G	Director General
DM	Dry Matter
DPM	Deputy Project Manager
ELISA	Enzyme-Linked ImmunoSorbent Assay
E/W	Extension Worker
FAO	Food and Agriculture Organization
F/P	Focal Person
GDP	Gross Domestic Product
GI (pipe)	Galbanized Iron (pipe)
G/S	Gender Specialist
HS	Hemorrhagic Septicemia
HQ	Headquarters
IGF-1	Insulin-like Growth Factor

Abbreviation	Original Term
ILRI	International Livestock Research Institute
IRM	Institute of Rural Management
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JPY	Japanese Yen
KMC	Kaihatsu Management Consulting
KP	Khyber Pakhtunkhwa
LDDB	Livestock and Dairy Development Board
MF	Microfinance
M/M	Minutes of Meeting
MOU	Memorandum of Understanding
M/P	Master Plan
MS (pipe)	Mild Steel (pipe)
M/T	Master Trainer
MTR	Mid Term Review
NCOC	National Command and Operation Centre
NDF	Neutral Detergent Fiber
NFEPP	Non-Formal Education Promotion Project
NGO	Non-Governmental Organization
NRSP	National Rural Support Programme
PC-I	Planning Commission I
PC-IV	Planning Commission IV
P&D	Planning and Development (Department)
PCR	Project Completion Report
PDDC	Pakistan Dairy Development Company
PDM	Project Design Matrix
P/F	Pilot Farmer
PKR	Pakistan Rupee
P/M	Project Manager
PMTF	Project Management Task Force
PR	Public Relations
PRA	Participatory Rural Appraisal
PRI	Poultry Research Institute
PSLD	Project on Sustainable Livestock Development in Rural Sindh

Abbreviation	Original Term
R/D	Record of Discussions
S/A	Stock Assistant
SAFWCO	Sindh Agricultural and Forestry Workers Coordinating Organization
SAGP	Sindh Agricultural Growth Project
S/C	Steering Committee
S/M	Social Mobilizer
SMFB	Sindh Microfinance Bank
SNE	Schedule for New Expenditures
SOP	Standard Operation Procedures
SPO	Strengthening Participatory Organization
SPU	Semen Production Unit
STD	Standard Deviation
TA	Tando Allahyar
TA/DA	Travel Allowance and Daily Allowance
T/C	Technical Committee
T-chol	Total Cholesterol
TDN	Total Digestible Nutrients
TE	Terminal Evaluation
TF	Taskforce
TMK	Tando Muhammad Khan
TNA	Training Needs Assessment
TOR	Terms of Reference
ToT	Training of Trainers
TP	Total Protein
TRDP	Thardeep Rural Development Programme
TWG	Technical Working Group
V/O	Veterinary Officer
W/S	Workshop

Currency Unit Rs.

Exchange Rate for June 2021: 1 Pakistan Rupee = 0.711670 Japanese Yen

(Source: 2021 JICA Exchange Rate Table)

Figures and Tables

Executive Summary

Project Backgrounds

In Pakistan, the livestock sector accounts for 50% of the total agricultural production and 10% of the national gross domestic product (GDP). Pakistan holds one of the largest numbers of livestock population globally and ranks 8th in cattle, 2nd in buffalo, 3rd in goat, 9th in sheep, and 4th in milk production, worldwide. Livestock is important for small-scale farmers, including tenant and landless farmers, as daily as well as emergent sources of nutrition supply and income, and form an invaluable asset. Livestock development is also crucial for creating employment opportunities and facilitating the social participation of women as they have been traditionally engaged in the feeding management of livestock in rural areas.

Sindh province, which is the target province of the project, holds 14 million cattle and buffalo, 3.2 times higher than that in Japan (4.4 million). This province has native tropical breeds such as the Red Sindhi cattle and Kundhi buffalo, which have spread to other tropical countries. Small-scale farmers constitute 80% of the livestock farmers in Sindh province, and hold 5.6 million cattle and buffalo. Thus, the development of the livestock sector in Sindh, particularly for small-scale farmers, needs to draw more attention to remedy the socio-economic disparity among people, stability, and development of the area.

However, the organizational structure and services of the Sindh Livestock Department have been mostly focusing on disease control in livestock by veterinarians, which prompts a lack of consideration regarding capacity development of human resources for the livestock industry or service appropriation for farmers. Farmers themselves have traditionally applied primitive livestock rearing technologies, leading to low productivity and failure to draw livestock potential.

Under these circumstances, the Japanese government has conducted a "Project for the Master Plan Study on Livestock, Meat, and Dairy Development in Sindh Province" (M/P Study) since July 2010. Based on the M/P study results, the "Project on Sustainable Livestock Development for Rural Sindh (PSLD)" was initiated in February 2014.

Target Districts

The project was implemented in the five target districts of Badin, Hyderabad, Matiari, Tando Allahyar (TA), and Tando Muhammad Khan (TMK). These districts are referred to as "pilot districts"

Project Purpose

The project aimed to establish a development foundation in the five pilot districts to promote further development of the livestock sector in the entire Sindh Province. The goal of livestock development is to increase the income and assets of livestock farmers through an increase in dairy and meat production and improvement of marketing in Sindh Province by expanding the project activities to non-pilot districts.

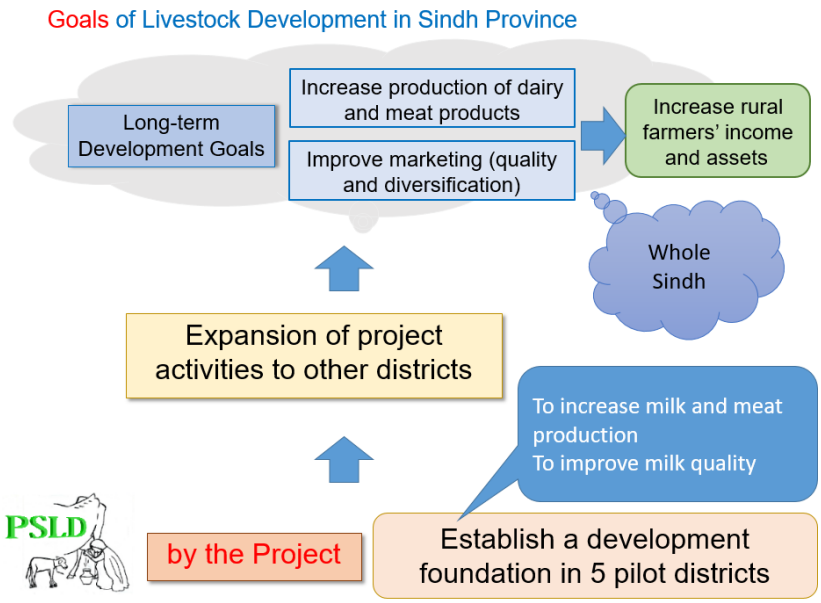


Figure: Project Purpose with Mid-term and Long-term Goals

The development foundation for the livestock sector comprises (1) technologies for livestock farmers, especially small-scale farmers, (2) human resources, and (3) institutions for livestock sector development, as indicated in Figure 1-2.

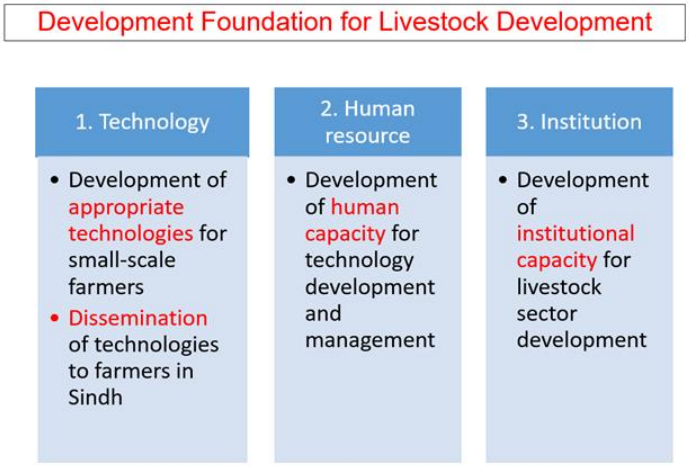


Figure: Foundation for Livestock Development

Project Implementation Period

The project was initiated in February 2014 and completed in June 2021.

Project Purpose

The foundation for increasing the incomes and assets of livestock farmers is built up in the pilot districts. (The foundation includes development of appropriate technologies, establishment of extension structures, strengthening concerned institution, and capacity-building of concerned officers)

Overall Goal

The appropriate technologies and the methods for utilizing livestock resources are adopted by the farmers in and outside the pilot districts.

Outputs

The Project aimed at producing the below four "Outputs" that would help achieving the abovementioned purpose and goal.

Output 1: The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms

Output 2: The methods for utilizing livestock resources are verified.

Output 3: The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts with gender consideration.

Output 4: The capacity of the Livestock Department for project planning, management, and coordination is strengthened.

Project Implementation Policy

Overall Policy

1. The Project Is for Building up the Foundation for the Long-Term Development Goal (100 Years Plan)
2. Promote Both Appropriate Technology Development and Institutional Development in a Balanced Manner

Basic Technical Policy

1. Select the Most Appropriate Technology for Micro-, Small-, and Medium Scale Farmers in Sindh Province through Verification of the Technology by the P/Fs
2. Identify Seven Fields of Appropriate Technology that Are Necessary for Livestock Technology Development
3. Verify an Economically and Socially Sustainable Mechanism for Effective Utilization of Livestock Resources
4. Establishment of a Sustainable Extension System
5. Utilize Overseas Training Opportunities and a Third-Country Expert's Resources to Enhance Livestock Technology Skill

Basic Management Policy

1. Develop and Strengthen the Ownership of the Livestock Department and Other Livestock Stakeholders in Sindh Province and Build Their Capacity
2. Create an Opportunity Where Japanese Experts Can Exchange Their Opinions

Overview of the Activities: Major Activities for Each Output

The Output-wise major project activities for the five project years are described below.

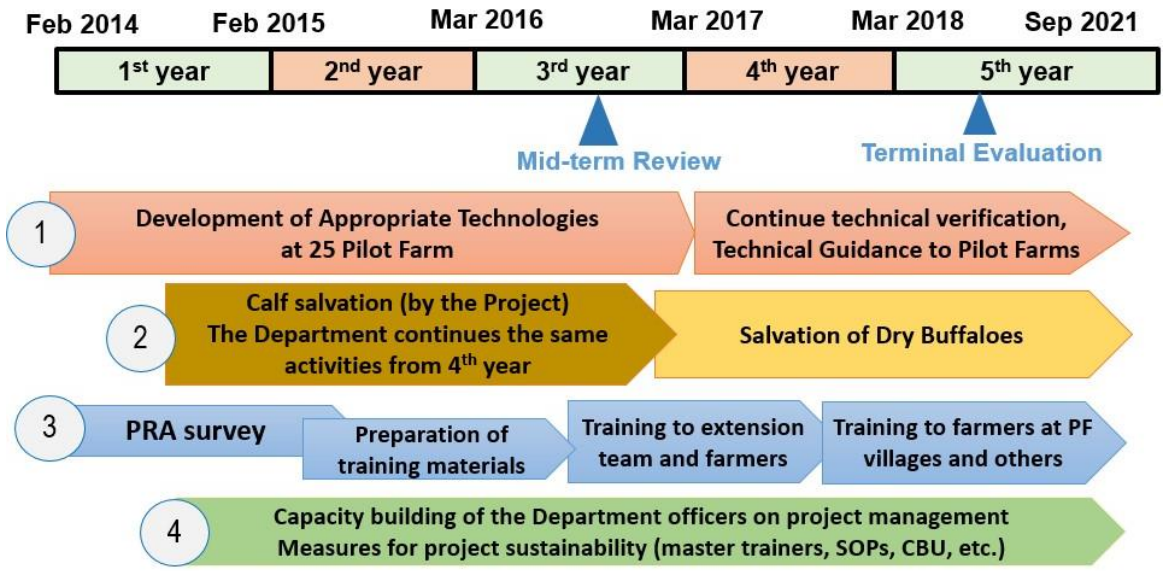


Figure: Overview of the Activities

1) Output 1: Developed and verified the appropriate technology at 25 pilot farmers (P/Fs) in the first three years. Continued technology development and provided technical guidance to P/Fs after the 4th year.
2) Output 2: Implemented calf salvation activity from the 2nd half of the 1st year until the 3rd year (the Department took over the activity after the 4th year). Implemented the dry buffalo salvation activity after the 4th year.
3) Output 3: Conducted participatory rural appraisal (PRA) surveys and prepared training materials from the 1st year until the 1st half of the 3rd year. Training was started on the extension team in the 2nd half of the 3rd year, followed by training to farmers and follow-up.
4) Output 4: Organized project management training courses every year to enhance the capacity of Department officers. Took various measures (development of master trainers : M/Ts, preparation of standard operation procedures : SOPs, and establishment, strengthening of Capacity Building Unit : CBU, etc.) to enhance project sustainability.

Levels of Achievement of Output-Level Indicators (As of June 2021)

Output 1

Narrative Summary	Objectively Verifiable Indicators
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms.	1-1. Effectiveness of appropriate technologies is verified at 25 pilot farms with the following indicators: 1) Average milk yield of cattle/buffaloes increases by more than 25 % compared with the current average of farmers in general (4 liters/day) 2) Average daily gain of cattle/buffaloes increases by more than 10 % compared with the current average of farmers in general (250 g/day) 1-2. The counterparts have the capacity to instruct extension workers and incumbent officers on the contents of the technology guidelines prepared by the Project.

Indicator No.	Levels of Achievement
1-1	This indicator was achieved in the 4th year as described below.
1)	As a result of a trial, average daily gain of calves with formula feed provision reached 8.8 kg, which was almost double that of calves without formula feed provision. The Terminal Evaluation (TE) Mission confirmed the achievement of this indicator, although under a specific condition of formula feed provision.
2)	According to the growth data of calves of up to 12 months old, the average daily gain of calves during the first 12 months was 0.33 kg for calves at P/Fs, 0.32 kg for 37 calves at the calf salvation center (1st year and 0.33 kg for 39 calves at the center (2nd year), all of which exceeded the Project Design Matrix (PDM) indicator target of 0.275 kg.
1-2	As a result of guidance from the Japanese livestock experts and a third-country expert (Dr. Videz), cooperation from national staff members, and devotion of all the counterparts (C/P) to the project activities, the indicators had been achieved by February 2019. The C/Ps already started providing technical training courses to other Department veterinary officers (V/O) and stock assistants (S/A).

The project conducted a trial provision of formula feed to 25 P/Fs for two years and eight months. As shown in the below Figure, the average 305-day milk production per head was 2,672 kg for the treatment group (n = 45) and 1,443 kg for the control group (n = 18), whereas the average daily milk production was 8.8 kg and 4.7 kg respectively. The results showed a nearly double increase in milk production.

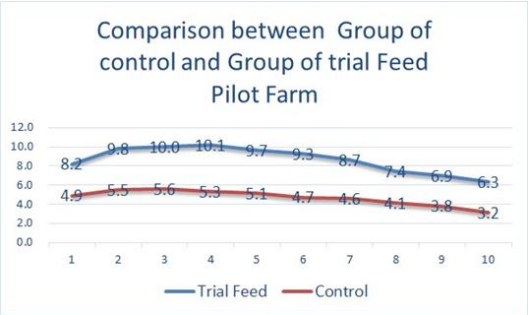


Figure: Comparison of Milk Production between the Control Group and Treatment Group

	
A complete simple milking shed at a P/F, Mr. Niaz's farm	A complete simple milking shed at a P/F, Mr. Ramzan's farm

Output 2

Narrative Summary	Objectively Verifiable Indicators
2. The methods for utilizing livestock resources are verified.	2-1. The survival rate of calves in 3 months after birth at the Calf Salvation Center exceeds 90% with the technology for salvaging new born calves. 2-2. The methods of calf salvation including rearing by farmers are proven to be economically viable. 2-3. It is confirmed that dry buffaloes are salvaged with improved reproduction technologies. 2-4. The counterparts have the capacity to promote effective use of livestock resources to the public and private entities according to the guidelines prepared by the Project.

Indicator No.	Levels of Achievement
2-1	The average survival rate of 3-month old calves in the past two years was confirmed to be 92% in the 3rd year. Therefore, the indicators were achieved.
2-2	The "salvaged calf distribution and rearing system" has three models. Model 1 (distribution of two 3-month old calves and collection of one heifer) and Model 2 (1 few-day old calf distribution for a fee) were verified with both the Japan International Cooperation Agency (JICA) budget and Planning Commission I (PC-1) budget. However, it is yet to be confirmed as "economically viable". One of the two main issues is that as the TE Mission pointed out, "the models cannot be said to be economically viable without initial financial support to small-scale farmers". Therefore, the project developed the Model 3, which distribute a single calf by using microfinance services. Through the 2 practices respectively with Sindh Microfinance Bank (SMFB) and National Rural Support Programme (NRSP), the Model 3 was verified. The other issue was the high rearing cost at the calf salvation center. The Department faces many constraints against making the activity economically viable because unlike private institutions, it is difficult to smoothly disburse the budget and to timely procure equipment and also because the human resource cost for many staff members assigned to the center is expensive. The JICA mission undertook a monitoring survey on the calf salvation activity from December 2019 to January 2020. Based on the survey, the JICA mission suggested a plan of establishing large-scale calf centers that enable large-scale rearing of several hundred heads in Hyderabad and in Karachi. This plan will decrease the 6-month rearing cost to Rs.25,000/head, and is thus expected to achieve economic viability of the activity.
2-3	The cases were confirmed at Nagori farm in the 4th year and at Mr. Haji Amir's farm in the old cattle colony in the 5th year. Therefore, the indicator was achieved.
2-4	C/Ps can now respond to inquiries from individual farmers and organize a calf salvation workshop (W/S). The C/Ps have accumulated a lot of experience through technical guidance to public and private stakeholders in the livestock sector. Therefore, the indicator was achieved.

	
Technical guidance on how to feed formula feed	Sufficient drinking water for calves

Output 3

Narrative Summary	Objectively Verifiable Indicators
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts with gender consideration	3-1. The counterparts, master trainers, and extension workers have a capacity to instruct farmers according to the extension plans and materials prepared by the Project. 3-2. Appropriate technologies are disseminated to about 3,000 (2,000 male and 1,000 female) farmers. 3-3. Effective methods for farmer-to-farmer dissemination of technologies are demonstrated

Indicator No.	Levels of Achievement
3-1	The level of understanding about the training contents of the extension team members were measured through training by several activities such as practice of question and answers for the farmers, quiz, and report writing. It was confirmed that each extension member had the necessary knowledge to conduct the farmer training. Therefore, this indicator was achieved.
3-2	The total number of participants that attended the training session more than two times was 3,559 (Male 2,347, Female 1,212). This achievement was much greater than the target number of 3,000 (Male 2,000, Female 1,000).
3-3	Regarding the farmer-to-farmer extension, the project expected that information would be disseminated from a core farmer to other farmers. In all, 19 core farmers were selected in the pilot villages. The core farmer training was completed. Fourteen core farmers out of 19 continued to disseminate information to the surrounding villages and others as of May 2021.

Table: Achievements of the Farmer Training

Villages	Times of training sessions				Number of training participants		
	For Male	For Female	Mixed-gender	Total (Times)	Male	Female	Total
Pilot village (24 villages)	196	177	14	387	932	704	1,636
Surrounding villages (43 villages)	326	143	26	495	1,415	508	1,923
Total	522	320	40	882	2,347	1,212	3,559

Table: Simple Average of Practice Ratio (%) for Nine Appropriate Technologies

Category	Simple Average of Practice Ratio (%)	
	Male farmer	Female farmer
Pilot village (the third monitoring)	77.3	77.1
Surrounding village, the first group (the second monitoring)	74.5	72.8
Surrounding village, the second group (the first monitoring)	75.5	N/A

Marketing training in a village

Animal health training in a village

Output 4

Narrative Summary	Objectively Verifiable Indicators
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-1. The annual plan report of the Project is prepared by the initiative of the Department. 4-2. The results of monthly monitoring is reported by the responsible district offices. 4-3. The annual evaluation report of the Project is prepared by the initiative of the Department. 4-4. The Livestock Development Platform is regularly held by the initiative of the Department. 4-5. The Standard Operation Procedures (SOP) is issued by the Department.

Indicator No.	Levels of Achievement of Indicators
4-1	A field visit and W/S for evaluating the previous year's project activities and for planning the same year's activities were conducted among the project team members every year. The activity plans were developed, reflecting the C/Ps' and project members' opinions. Various training courses on project management skills were conducted, and thus, many officers now understand the importance of having a cycle of planning and evaluating projects. However, the Department has still not reached a level where it can "initiate" and conduct project cycle management of all projects including this project.
4-2	The progress of appropriate technology development activities (Output 1 and 2) was regularly reported in the C/P meeting held every Friday. The progress of extension activities (Output 3) was monthly reported from District offices to the Provincial office. For training related activities (Output 4), the CBU held regular meetings among members and also with Japanese experts. From these results, this indicator is considered to have been achieved.
4-3	Same as 4-1.
4-4	Five Platform meeting were held during the project period. The Department initiated the planning and organization of the 4th and 5th meetings; thus this indicator is said to have been achieved.
4-5	Six SOP documents were developed but are yet to be announced as official Department documents. The documents will be utilized when the Department continues the project activities after its completion.

In addition to the abovementioned achievements, other achievements that are related to other Outputs are described below.

1	The CBU was established, strengthened, and is now able to plan, implement, and follow-up training courses. The CBU is expected to be a permanent unit that plans, implements and follows up any kinds of training courses organized within the Department.
2	Overall, six SOPs on project activities were developed through "SOP development training" courses. Department officers can refer these documents when they implement the project activities.
3	The Capacity Building Strategy (CBS) was developed. The Department now has its own guidelines for human resource development. The action plan and budget proposal were also prepared.
4	The Department can now conduct Livestock Development Platform meetings that invite Sindhi livestock sector stakeholders independently.

Lecture scene from the Report Writing Course

Participants are developing SOPs

Levels of Achievement of Project Purpose Indicators (As of June 2021)

Project Purpose Indicators	Levels of Achievement
In the project districts: 1. More than 70% of the target group (excluding the pilot farmers) regularly use at least one of the nine "A" rank appropriate technologies shown in the attached Appropriate Technology Development Checklist as monitoring indicators within one year from training completion. Whereas, more than 50% of the target group continue to regularly use at least one of the same nine technologies even after more than one year from training completion. 2. All guidelines developed by the Project are officially acknowledged by the Livestock Department. 3. Some stakeholders (e.g. commercial farmers, NGOs, target groups) in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes. 4. The counterparts, extension workers and other staff including incumbent officers in the pilot districts have the capacity to support farmers according to the guidelines prepared by the Project 5. The Standard Operation Procedures (SOP) is implemented by the Department to apply the guideline of technology, the extension plan and materials prepared by the Project for the entire Department.	1. The monitoring survey revealed that more than 50% of the farmers who had participated in the training sessions conducted in the pilot or surrounding villages had been using the A-rank technologies even after one year or more after the training sessions. 2. All project guidelines for appropriate technology development, calf salvation, extension, and training were handed over to the Livestock Department in the 10th Steering Committee (S/C) held in January 2019. The training course was held in April 2021 with the objective of realizing the official acknowledgement of six SOPs by the Department. The succeeding process of a consultation meeting with key officers, the last S/C and the Secretary's approval on the official acknowledgement was originally planned for May and June 2021. However, this process did not proceed because the Japanese experts' trip was canceled; therefore, an online meeting was held on June 24, wherein it was confirmed that the Secretary would notify the Department officers regarding the official acknowledgement of the SOPs. 3. More institutions such as HANDS, SMFB, and NRSP have now started calf salvation activities, and the number of cases is thus increasing. NRSP combines the activity with their no interest microfinance service. Dry buffalo salvation is also continued by public and private veterinarians who received technical guidance from the C/Ps and who now continue reproductive disorder diagnosis and treatment of female buffaloes. Farmers now continue to rear pregnant dry buffaloes because their value is increased. Such cases are often confirmed. 4. Achieved. The C/Ps continue to provide support to farmers through their daily activities. They also train other V/Os and S/As as trainers. However, extension team members who had been hired as temporary staff left the Department because their agreement was expired. 5. Six SOPs were prepared to continue the project activities. The actual users of the SOPs, that is, the C/Ps, Extension Team, and CBU, developed and still use these SOPs; it is thus expected that the Department will continue to effectively utilize the SOPs when it conducts the same activities.

According to the above Table, almost all the project purpose indicators have been "achieved" although some require further actions from the Department.

Levels of Achievement of Overall Goal Indicators

The appropriate technologies and the methods for utilizing livestock resources are adopted by the farmers in and outside the pilot districts

As mentioned above, it can be said that "almost all project purpose and Output-level indicators have been achieved. However, it is still not known whether the overall goal will be achieved".

Suggestions for Achievement of Overall Goal and Sustainability Improvement

Project Sustainability Improvement Measures

The objective of this project was "to build up a foundation for livestock development in the pilot districts. The foundation refers to livestock technology, human resource, and institutional foundations. The project expected its activities to be continued on these foundations and expand into the pilot and non-pilot districts in the mid-and long-run, which would result in an increase in the income and assets of livestock farmers in Sindh Province. Therefore, the project was planned and implemented assuming that it would continue for a long time in the future.

In terms of building foundations, the project has verified the appropriate technologies, the results of which were compiled into technological guidelines. The project also developed human resources who understood these technologies and who were able to disseminate the technologies to farmers. The extension method was also verified. All related manuals and guidelines for project activities have been developed. On the contrary, the Department's institutional capacity and systems that enable the above-mentioned activities are still weak. The foundation building seems to require more time, and the Department still needs continuous back-up support from external entities in this aspect. The budget for continuing the project activities will, of course, be required, but there is still no prospect on budget allocation of the budget. The below Table summarizes the suggestions from the project team on how to continue the project activities and to implement sustainability improvement measures.

Table: How to Implement Project Sustainability Improvement Measures (Suggestions)

Project Sustainability Improvement Measures		How to Implement the Measures (Suggestions)
【Budget】		
1	Securing the Activity Budget	The project was completed. The Department now has to develop Project Completion Report (PCR) / Planning Commission IV (PC-IV) and submit it to the Sindh Government. The Department is recommended to re-request the Sindh Government to allocate the necessary budget for continuing the project activities or, if this is difficult, to request the Chief Minister (C/M) for allocating a special budget. However, it is unlikely that the request will be accepted in either case. Nevertheless, there is a possibility of approval on human resource allocation, that is, continuous assignment of C/Ps to the project activities. Starting from this, the Department is expected to continue some of the project activities even with a very small amount of the available budget. As the project developed such human resources as C/Ps and M/Ts on project management related subjects within the Department, the Department can conduct training courses without any budget, thus mobilizing these officers as trainers.
【Institutional Structure】		
2	Restructuring of the Department	Many instances of discussions on the restructuring of the Department have been held among the Minister Livestock, the Secretary Livestock, the Director General (D/G) and almost all the other Department key officers. All the participants have recognized and

Project Sustainability Improvement Measures		How to Implement the Measures (Suggestions)
		agreed on the necessity of restructuring. A strong commitment of the Secretary Livestock and the Sindh Government leaders is required to realize such a major transformation of the Department. The project team has observed that the Sindh Government is yet to recognize the importance of the Livestock Department's role in livestock development. Therefore, the Department still needs to repeatedly continue suggesting the importance and necessity of establishing a Directorate of Extension. The Department has already decided to recruit 500 veterinarians. Taking this opportunity, the Department is expected to recruit veterinarians who are interested in technology extension to farmers and to assign them to extension activities. By completing this, it is expected that extension activities will be restarted. Continuous follow-up to the Secretary Livestock is important.
3	Establishment of the Extension Structure in Pilot and Non-Pilot Districts	Dr. Anisa, a female Extension Team Leader, was recruited by the Livestock Department as a regular officer. Establishment of an extension structure will not happen until restructuring of the Department takes place, but the Department can restart the extension activity by assigning her the responsibility of the extension activity and mobilizing officers who are interested in the extension activities. Continuous follow-up to the Secretary Livestock is again important.
4	Establishment of the Reporting and Monitoring Structure	Establishment of a reporting and monitoring structure also depends on restructuring the Department. As mentioned later, the Sindh Government still does not understand the concept and methods of "project management;" therefore, it is important to steadily continue providing training sessions to as many Sindh Government officers as possible (especially, to decision-making level officers) and let them understand the importance of project management.
5	Establishment and Strengthening of CBU	The project provided various training courses on both technical and management subjects to Department officers. Throughout the training implementation process, the CBU developed its capacity of initiating the whole process from training needs assessment to planning, implementation and follow-up. Two full-time officers were assigned to the CBU; thus, it is important to continue their assignment at the CBU, which requires an action to obtain the consensus of the Secretary Livestock.
【Human Resource Development】		
6	M/T Development	As mentioned above, C/Ps can immediately start delivering training courses to other Department V/Os and S/As. Likewise, 10 officers were certified as M/Ts on three management-related subjects (project management, social mobilization and effective communication with livestock farmers), and they are thus ready to deliver training courses to other officers on the same topics.
7	Core Farmer Development	The project developed 19 "core farmers". Of these, 14 still continue to play an intermediary role in transferring technologies to other farmers. The Department will be

Project Sustainability Improvement Measures		How to Implement the Measures (Suggestions)
		able to develop more core farmers if essential factors for enabling farmer-to-farmer technology transfer are identified through a social survey.
【Knowledge and Know-hows】		
8	Raising Awareness on Project Management and Basic Skill Improvement	The Sindh Government does not understand the basics of project management; therefore, the Government develops plans without having any strategy or policy, or without evaluating its past experiences. The centralized system requires a long process from approval of plans to allocation of the budget. Implementation and monitoring is done without subjectivity. It is important to continue providing training to decision-making level officers in a stepwise manner so that they will understand the importance and basics of project management.
9	SOP Development and Official Approval	The project developed six SOP documents on Output 1 to 4 activities. Even Department officers newly assigned to the project activities will be able to understand how to use the other manuals and guidelines and to implement the activities by reading these documents. It is important to continuously talk to the Secretary Livestock to approve those SOP documents as official documents of the Department.
10	Development of CBS	The project developed the CBS so that the Department could plan and implement training (especially on management subjects) to Department officers systematically. The guideline describes each of the short-term, mid-term, and long-term issues that require actions, and so, the Department is expected to use the guidelines when planning training for Department officers in the future.

The D/G and C/Ps understand the importance of continuing the project activities, but the decisions should initially be made by the Secretary Livestock and other Sindh government decision makers and Departments such as the C/M, Minister Livestock, Chief Secretary (C/S), Finance Department, Services, General Administration & Coordination Department, and P&D Department. The D/G and C/Ps are expected to promote the actions of higher authorities. A back-up support from the JICA Officers for their efforts is also strongly needed.

3-Year Action Plan

In January 2020, 3-year action plans on each of Output 1 to 4 were developed to enhance project sustainability after the completion of JICA assistance. Implementation of the plan was intended to start in July 2020, but can be started at any time when the budget is allocated for any of the actions of each output. The below Table summarizes the major actions included in the plan and the 3-year targets to achieve.

Table: 3-Year Action Plan and Targets

Outcome	Major Actions	3-Year Targets
1	1. Appropriate technology training for Department V/Os and S/As 2. Reproductive disorder training for private veterinarians 3. Hoof-cutting training for private technicians	1. To increase the capacity of 15 V/Os and 75 S/As on appropriate technologies in five pilot districts 2. To increase the capacity of 45 veterinarians on the diagnosis and treatment of reproductive disorders in cattle and buffaloes. To strengthen the Kundhi Buffalo Breeders Association for livestock genetic improvement 3. Six times of hoof-cutting W/S.
2	1. Continue the calf salvation activity at the calf center 2. Expand the calf salvation activity by coordinating with non-governmental organizations (NGO) and microfinance institutions.	1. 240 calf salvation cases. 2. To promote and replicate the calf salvation model by engaging stakeholders such as NGOs, commercial farmers, rural farmers, etc.
3	Extension of appropriate technologies	To disseminate appropriate technologies to another 3,000 farmers (1,500 male and 1,500 female)
4	Continue management training to the Department officers	To build the capacity of 251 Department officers and officials for improving their management skills

In July 2021, the D/G and the C/Ps took initiative in reviewing the action plan and started discussion "for establishing the PSLD Management Committee for implementing the action plan." Once the plan is developed after the discussions, the D/G will submit the plan to the Secretary Livestock. However, there is also the possibility that such a positive atmosphere will be lost due to human resources and budget constraints. The JICA Office's strong support is again requested for the Department to implement at least part of the action plan activities. It is possible to conduct a follow-up of some of the Output 1 activities listed in the above Table through a mini-technical cooperation project on reproduction that will start in or after this year.

Project Success Factors

The project faced many issues throughout the implementation process; however, as mentioned earlier, most of the project indicators were achieved. The success factors for that are described at the end of the executive summary

- ✓ Commitment of the Project Team Members: The most prominent success factor is that all local project team members were seriously involved in the project activities. They tried their best to learn from the Japanese experts and showed their commitment to achieving the project indicators, which resulted in project success.

- ✓ Support from the Livestock Department: The Japanese experts and the Department trusted each other highly because they had worked together for the past 10 years since the start of the M/P Study. The entire Department supported and cooperated with the project activities.
- ✓ Farmers' Interest and Motivation: One of the main project site was the P/Fs. The sincere efforts of the P/Fs who had received technical guidance from the project allowed increased milk production and body weight of calves. Calf salvation beneficiary farmers also reared and distributed the calves very carefully, which led to a high survival rate. Many farmers participated in the farmers' training sessions. More than half of them utilized technologies that they had learned in the training sessions, even one year after the session. Farmers are interested and motivated enough to learn new technologies, and it was proved that support can be effective with a proper approach and proper contents. The project hopes that the Department understands this fact and utilizes this lesson for future support to farmers.

Chapter 1 Project Overview

1.1 Project Background

In Pakistan, the livestock sector accounts for 50% of the total agricultural production and 10% of the national gross domestic product (GDP). Pakistan holds one of the largest numbers of livestock population globally and ranks 8th in cattle (36.9 million), 2nd in buffalo (32.7 million), 3rd in goat (63 million), 9th in sheep (28.4 million), and 4th in milk production (35.5 million tons), worldwide. Livestock is important for small-scale farmers, including tenant and landless farmers, as daily as well as emergent sources of nutrition supply and income, and form an invaluable asset (livestock accounts for 10 to 50% of small scale farmers' income and asset). Livestock development is also crucial for creating employment opportunities and facilitating the social participation of women as they have been traditionally engaged in the feeding management of livestock in rural areas.

Sindh province, which is the target province of the project, holds 14 million cattle and buffalo, 3.2 times higher than that in Japan (4.4 million). This province has native tropical breeds such as the Red Sindhi cattle and Kundhi buffalo, which have spread to other tropical countries. Further, the province holds Karachi, the largest commercial city in the country, and is an exporting hub port to the Middle East and Asia.

These are considered as comparative advantages and potential for development; however, the Sindh livestock sector has been overlooked because of the concentration of public services and investment in Punjab province. Sindh province has also been vulnerable to risks such as continuous floods and droughts, and its poverty rate in rural areas is double that in urban areas, leading to instability of the province as well as the country. Small-scale farmers constitute 80% of the livestock farmers in Sindh province. They hold 5.6 million cattle and buffalo, and have traditionally practiced mixed farming with crop cultivation and livestock rearing. Thus, the development of the livestock sector in Sindh, particularly for small-scale farmers, needs to draw more attention to remedy the socio-economic disparity among people, stability, and development of the area.

The Sindh provincial government in its policy, promotes livestock sector development with initiative from the private sector, and takes care of socially vulnerable farmers including tenant and landless farmers, through public services. However, the organizational structure and services of the Sindh Livestock Department have been mostly focusing on disease control in livestock by veterinarians, as derived from the British colonial era. This prompts a lack of consideration regarding capacity development of human resources for the livestock industry or service appropriation for farmers. The Department

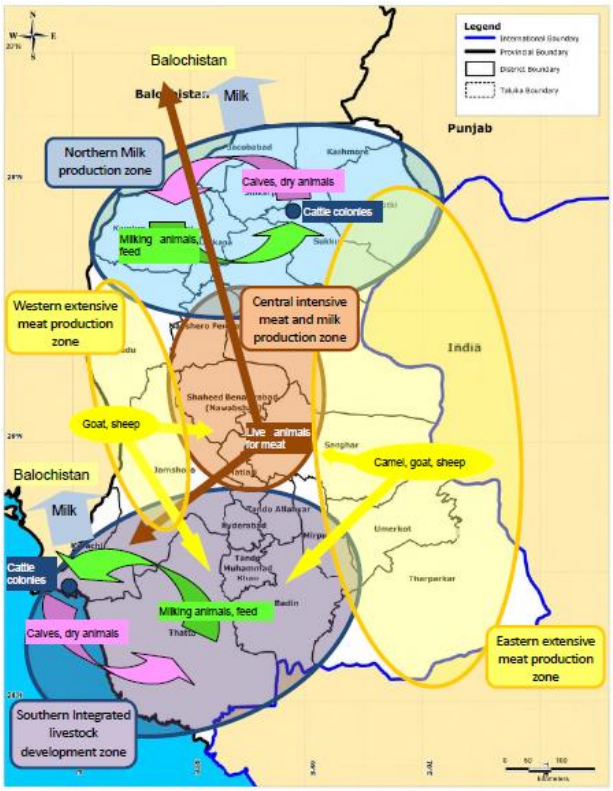


Figure 1-1 Strategic Zone for Livestock Development in Sindh Province

is yet to present a clear vision for public-private partnerships or implementation structures. Furthermore, farmers have traditionally applied primitive livestock rearing technologies, leading to low productivity and failure to draw livestock potential.

Under these circumstances, the Japanese government has conducted a "Project for the Master Plan Study on Livestock, Meat, and Dairy Development in Sindh Province" (M/P Study) since July 2010, and its M/P report was prepared in October 2011. The M/P report identifies the characteristics and comparative advantages of the province for livestock development, and based on these, development strategies, implementation structures, and action plans by 2020 have been prepared mainly targeting the small-scale farmers. In the M/P, this province is divided into five zones, as shown in Figure 1-1, and the development directions and goals for each zone have been recommended.

Based on the M/P, the Sindh government proposed a technical cooperation project with the Japanese government for the development of appropriate livestock technologies to be implemented in the southern integrated livestock development zone, which is one of the five zones. After a detailed planning survey by Japan International Cooperation Agency (JICA), the Record of Discussion (R/D) for implementing the "Project on Sustainable Livestock Development for Rural Sindh (PSLD)" was signed in August 2013 between the two governments, and the project was initiated in February 2014.

1.2 Target Districts

The project was implemented in the five target districts of Badin, Hyderabad, Matiari, Tando Allahyar (TA), and Tando Muhammad Khan (TMK), all of which belong to the southern integrated livestock development zone. These districts are referred to as "pilot districts"

1.3 Project Purpose

The project aimed to build up a development foundation in the five pilot districts to promote further development of the livestock sector in the entire Sindh Province. The goal of livestock development is to increase the income and assets of livestock farmers through an increase in dairy and meat production and improvement of marketing in Sindh Province by expanding the project activities to non-pilot districts.

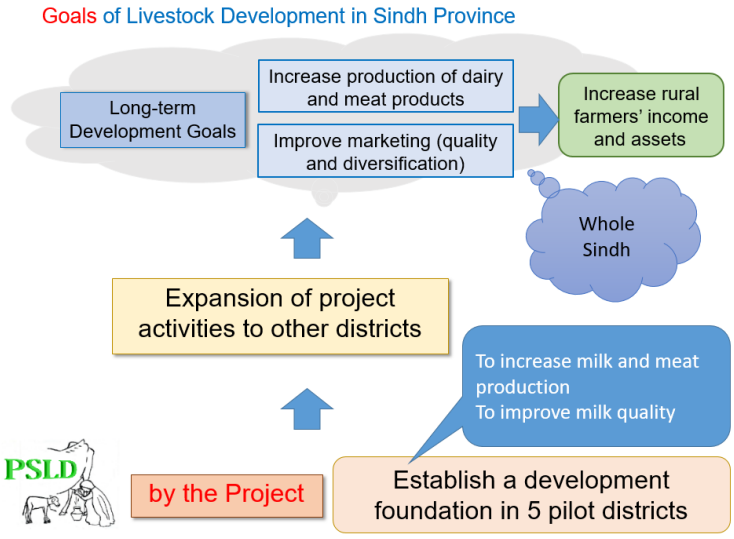


Figure 1-2 Project Purpose with Mid-Term and Long-Term Goals

The development foundation for the livestock sector comprises (1) technologies for livestock farmers, especially small-scale farmers, (2) human resources, and (3) institutions for livestock sector development, as indicated in Figure 1-2.

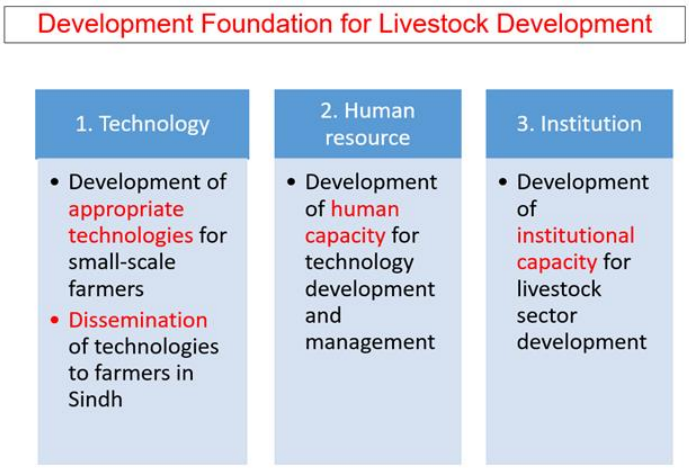


Figure 1-3 Foundation for Livestock Development

1.4 Project Implementation Period / Consultancy Agreement Period

The R/D for implementation of the project was singed on 20 August 2013. The R/D decided the project implementation period to be five years from the first day of Japanese experts' activity in Pakistan (February 2014). However, the project period was first extended until June 2020, and then re-extended until June 2021 due to the spread of COVID-19 (Coronavirus Disease of 2019).

Consequently, the original consultancy agreement period of five years from February 2014 until January 2019 was extended to seven years and eight months from February 2014 to September 2021 as a result for four times of extension of the 5th year agreement, as summarized below.

- 1st Year：February 2014 to February 2015
- 2nd Year：February 2015 to February 2016
- 3rd Year：March 2016 to March 2017
- 4th Year：March 2017 to March 2018
- 5th Year：March 2018 to September 2021

Although the project activities in Pakistan were planned in May or June 2021 when the R/D was re-extended, the activities in Pakistan were suspended after March 2020 due to the long-lasting spread of COVID-19 and were then managed remotely by Japanese experts until the end of the project period.

1.5 Project Purpose, Overall Goal, Expected Outputs and Activities

After the mid-term evaluation and the terminal evaluation, the project set the below-listed project purpose, overall goal, expected Outputs, and activities.

Project Purpose

The foundation for increasing the incomes and assets of livestock farmers is built up in the pilot districts. (The foundation includes development of appropriate technologies, establishment of extension structures, strengthening concerned institution, and capacity-building of concerned officers)

Overall Goal

The appropriate technologies and the methods for utilizing livestock resources are adopted by the farmers in and outside the pilot districts.

Outputs

The project aimed at producing the below four "Outputs" that would help achieving the abovementioned purpose and goal.

Output 1 : The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms
Output 2 : The methods for utilizing livestock resources are verified.
Output 3 : The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts with gender consideration.
Output 4 : The capacity of the Livestock Department for project planning, management, and coordination

Activities

Below is a list of respective activities for producing the four Outputs.

Common

0. Conduct the baseline survey.

Output 1

1-1. Select the pilot farms
1-2. Prepare the technology development plan with the pilot farmers
1-3. Conduct and analyse the on-farm applications at pilot farms
1-4. Prioritize appropriate technologies to be disseminated.
1-5. Monitor and evaluate the application of the identified technologies at farms
1-6. Conduct researches and/or activities with the stakeholders
1-7. Prepare and revise the guideline of technology based on the results
1-8. Conduct training on appropriate technologies for incumbent officers and staff (district deputy directors, veterinary officers, para-vets) in the pilot districts

Output 2

2-1. Select and prepare the Calf Salvation Center
2-2. Examine methods of buffalo calf distribution, dry buffalo distribution, and livestock sharing for dry buffaloes
2-3. Prepare the application plan for utilizing livestock resources.

2-4. Conduct and analyse the applications
2-5. Apply the identified methods to the farmers
2-6. Monitor and evaluate the application of the identified methods
2-7. Prepare the guideline of utilizing livestock resources

Output 3

3-1. Prepare the extension plan
3-2. Prepare the extension materials
3-3. Conduct trainings for the master trainers and extension workers including women
3-4. Conduct extension activities for farmers
3-5. Monitor and evaluate the extension activities
3-6. Review and revise the extension plan and materials

Output 4

4-1. Prepare operation guideline for the project including project management, information sharing, coordination, etc.
4-2. Conduct training for project planning, management and monitoring.
4-3. Establish a livestock development platform for coordination and information sharing among stakeholders
4-4. Review and revise the guideline
4-5. Organize training for the establishment of implementation structure for disseminating appropriate technologies in non-pilot districts.

Chapter 2 Project Implementation Policy and Structure: Overview of Activities and Inputs

2.1 Implementation Policy

2.1.1 Overall Policy

The project was implemented under the following overall policy.

(1) The Project Is for Building up the Foundation for the Long-Term Development Goal (100 Years Plan)

The M/P Study, which preceded this project, developed the following "Vision 2020" through various discussions with the authorities concerning livestock development in Sindh Province.

> The Sindh Province will aim to build up a foundation for modernizing the livestock sector through development and extension of appropriate technology and promotion of public-private partnership.

The M/P called the period until 2020 as the "foundation building up period" and set up the target of building up a foundation for modernizing the livestock sector through the development and extension of appropriate technology and promotion of the public-private partnership. The following five directions for the development suggested in M/P:

1) Increase in production of dairy and meat products and improvement of quality
2) Development that benefits both wealthy and vulnerable farmers
3) Increase of farmer income and creation of assets as an ultimate target
4) Focus on development potential and comparative advantages leading to local people's pride and dignity
5) Private sector-led development

The M/P also suggested that to achieve the abovementioned goals, Sindh Province should work on developing appropriate technologies, human resources, systems and institutions in the short-term or mid-term. This project was based on the directions and the short-and mid-term goals that had been laid out by the M/P and defined itself as "the project for building up of the necessary foundation for achieving the long-term goal"

(2) Promote Both Appropriate Technology Development and Institutional Development in a Balanced Manner

The project aimed for developing appropriate technology by Outputs 1 and 2, and institutional development to disseminate the developed technology to farmers by Output 3 and 4. In implementing the project, the project team especially focused on human resource development for all four Outputs, with a balance among each other because it was necessary for both technology development and institutional development.

2.1.2 Basic Technical Policy

Pilot farmers (P/F) were selected in each pilot district for verifying the appropriate technology for production increase and quality improvement, which would benefit small-and medium-scale farmers. The appropriate technology, which was later disseminated by the project, was selected from various technologies

that were tested, analyzed, and evaluated by the P/Fs. The project also worked with a university for developing technologies that were difficult to verify by the P/Fs, such as reproductive health and feed ingredient analysis. The selected appropriate technologies were documented as guidelines and applied to surrounding non-P/Fs and to farmers in non-pilot villages. The entire process contributed to the establishment of the most appropriate technology for Sindh Province after many trials and errors. The project was implemented under the following five basic technical policies:

A husband and a wife during milking

(1) Select the Most Appropriate Technology for Micro-, Small-, and Medium Scale Farmers in Sindh Province through Verification of the Technology by the P/Fs

The project selected five P/Fs from each district, considering different factors such as scale (mainly small- and micro-, and partially medium), management style, and production sales style. The project also considered the baradari and religious aspects so that socially vulnerable people would not be excluded. The P/Fs were selected according to the selection criteria, which were developed after conducting detailed interviews with farmers on topics such as the degree of land possession, characteristics of farmers and buffaloes, and experience of damage due to flood. In particular, the degree of land possession can vary the levels of farmers' access to feed and water, which are essential resources for livestock activities; therefore, the project considered this aspect well in addition to the number of buffaloes when selecting target groups and developing assistance approaches.

(2) Identify Seven Fields of Appropriate Technology that Are Necessary for Livestock Technology Development

Comprehensive activities in different fields of farm management, marketing, feeding management, fodder, reproduction, animal health, and genetic improvement are essential for developing livestock technology to increase production and improve quality. Therefore, technologies related to all of the abovementioned seven fields were verified. Appropriate technologies that were most suitable to the actual situations and needs of farmers were verified. Women's roles were also considered when verifying the appropriate technologies.

A buffalo (Body Condition Score 2.5)

(3) Verify an Economically and Socially Sustainable Mechanism for Effective Utilization of Livestock Resources

The project verified the feasibility and sustainability of an economically and socially realistic mechanism for the three different methods of livestock resource utilization: 1) calf salvation and utilization, 2) dry buffalo recycling, and 3) livestock sharing and revolving. Each activity was implemented under the following basic policies:

A cattle colony in Hyderabad
Newly born calves are collected by motorbike and their legs are tied with a rope. The calves are brought to a collection point without much care. On average, 20 to 30 calves are collected every day. At 18:00 a butcher's truck arrives to pick them up.

From the project, three calves were distributed to small scale farmers

1) Calf Salvation and Utilization

There are cattle colonies in Karachi and Hyderabad for one-time milking at large scale (approximately 90% were buffaloes). The number of cows and buffaloes was estimated to be about 1.2 million (at eight colonies) in Karachi, about 20 thousand (at two colonies) in Hyderabad, totaling about 1.22 million, from which about 35 thousand calves were born annually. However, it was assumed that 100% of the male calves and about 55% of the female calves were slaughtered within a week after birth due to reasons such as lack of space and high costs of milk for rearing. Thus, the precious livestock resources of 27 thousand calves were lost in Karachi and Hyderabad every year. Therefore, the project's mandate was to develop a mechanism that would effectively utilize these precious resources. The project developed a mechanism that functioned economically and socially and targeted three parties of cattle colonies (calf providers), rural communities (calf recipients), and public or private farms that would later become an intermediate entity.

2) Dry Buffalo Recycling

At a cattle colony, dry buffaloes were not slaughtered but were kept with buffaloes having high milking capacity. This percentage was estimated to be approximately 20%. The project considered that half of the remaining 80% would also be recycled. The project verified dry buffalo recycling at the same farm that provided the calves.

3) Application of Animal Sharing and Revolving

The project verified the mechanisms of calf salvation, utilization, and dry buffalo recycling to distribute such resources to farmers in an economically and socially fair manner. The project verified these mechanisms after understanding and applying the local practices of livestock sharing and livestock revolving

in the rural communities of Sindh Province.

(4) Establishment of a Sustainable Extension System

Extension is a new challenge for the Livestock Department. The project newly recruited members for the extension team aimed to establish a sustainable extension system. The project formed an extension team made of one male Veterinary Officer (V/O) as an Master Trainer (M/T), two male Stock Assistants (S/A) and two female V/Os as four Extension Workers (E/W) in each pilot district. The district teams disseminated the livestock technology verified at the P/Fs.

(5) Utilize Overseas Training Opportunities and a Third-Country Expert's Resources to Enhance Livestock Technology Skills

1) Training Program in Japan on Livestock Technology

The main topics were genetic improvement and feeding management, both of which showed prominent results in Japan and were expected to contribute toward livestock development in Pakistan.

2) Training Program in Japan on Institutional Development of the Livestock Department

There was another program that included lectures on Japan's livestock policies and various systems to increase the trainees' understanding and to contribute to the institutional development of the Livestock Department.

3) Third-Country Training Program to Supplement Lessons from the Training Program in Japan

The third-country training program was originally planned to be held in India. However, the training was conducted in Thailand because of difficulties in organizing the training program in India. The trainees learned about Thailand's livestock development history and the current situation regarding all the technical fields of the project target.

4) Invite a Third- Country Expert to Conduct a Field Survey and to Provide Technical Guidance

The project invited a Bolivian senior livestock expert that had been trained by JICA's technical cooperation project in Bolivia. He conducted a field survey on the reproductive function of male buffaloes and provided technical guidance.

2.1.3 Basic Management Policy

The project was implemented under the following two basic management policies for smooth implementation and sustainability improvement.

(1) Develop and Strengthen the Ownership of the Livestock Department and Other Livestock Stakeholders in Sindh Province and Build Their Capacity

The project targeted the build-up of a sustainable livestock development foundation; thus, the capacity building of livestock sector stakeholders, including the Livestock Department officers, was an important topic. The Sindh Government was expected to achieve the overall goal and the mid-term and long-term goals laid out by the M/P after completion of the project. For this, it was considered important that the project would develop and strengthen the ownership of the livestock stakeholders in Sindh Province, especially the Livestock Department, and develop a mechanism promoting the continuous capacity building of the officers.

The project conducted various training sessions, workshops (W/S), and meetings for the capacity development of officers in essential skills such as project operation, management, coordination, leadership, problem analysis, and calculation. The project contracted a private training institute for planning and implementing the training but involved the Department in the process so that it could acquire skills in planning and implementing training independently.

Besides, the project organized an annual "Livestock Platform Meeting" in which related governmental authorities, universities, private companies, other development partners, and non-governmental organizations (NGO) in the livestock sector were invited to provide their feedback on the project activities and also to discuss topics such as the direction of livestock development, establishment of public-private partnership, and responsibilities of each stakeholder. Through these platform meetings, the responsibilities and mandate of the Department were clarified.

(2) Create an Opportunity Where Japanese Experts Can Exchange Their Opinions

Appropriate technology development and guideline development required the efforts and contributions of many Japanese technical experts. However, most of those experts were engaged in the project activities on a short-term trip basis; the project organized an annual "Livestock Technology Committee" in which all the Japanese technical experts involved in the project were invited to exchange their opinions and to share field data for developing more effective guidelines. The committees were held four times between the 1st and 4th year.

2.2 Overview of the Activities

The Output-wise major project activities for the five project years are listed in Figure 2-1.

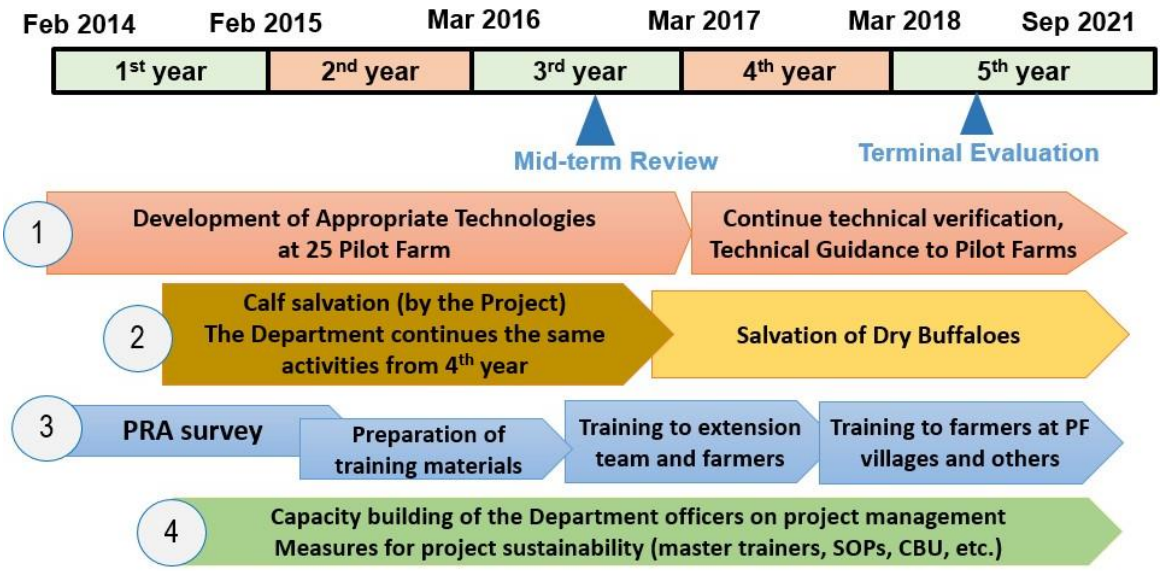


Figure 2-1 Overview of the Activities

1) Output 1: Developed and verified the appropriate technology at 25 P/Fs in the first three years. Continued technology development and provided technical guidance to P/Fs after the 4th year.

2) Output 2: Implemented calf salvation activity from the 2nd half of the 1st year until the 3rd year (the Department took over the activity after the 4th year). Implemented the dry buffalo salvation activity after the 4th year.
3) Output 3: Conducted participatory rural appraisal (PRA) surveys and prepared training materials from the 1st year until the 1st half of the 3rd year. Training was started on the extension team in the 2nd half of the 3rd year, followed by training to farmers and follow-up.
4) Output 4: Organized project management training courses every year to enhance the capacity of Department officers. Took various measures (development of master trainers: M/Ts, preparation of standard operation procedures: SOPs, and establishment and strengthening of Capacity Building Unit: CBU, etc.) to enhance project sustainability.

The project accepted the Mid-Term Review (MTR) Mission in August 2016 and the Terminal Evaluation (TE) Mission in September 2018. As a result of these missions, Project Design Matrix (PDM) Ver. 3 and Ver. 4 were developed in December 2016 and October 2018, respectively.

2.3 Implementation Structure

The project implementation structure is shown in Figure 2-2.

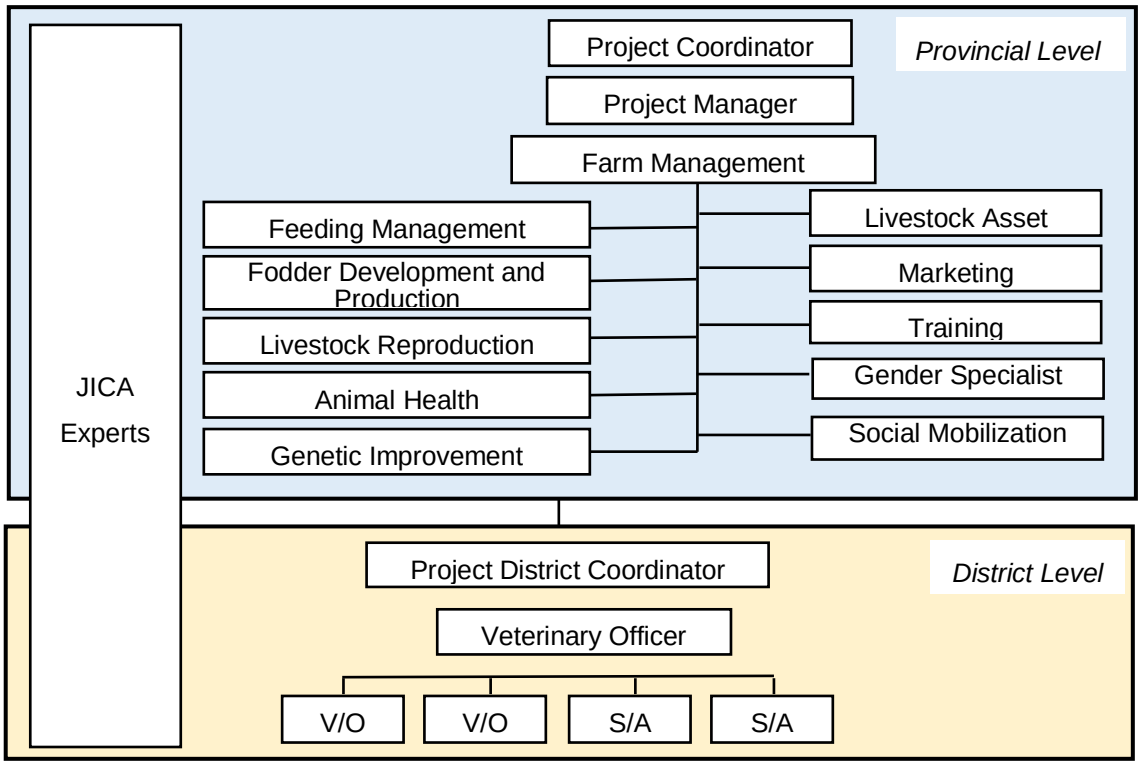


Figure 2-2 Project Implementation Structure

To commence the project activities, the Livestock Department of Sindh Government assigned project coordinator, project manager (P/M), and counterpart (C/P) staff who would work directly for the project activities from among its own officers. The Director General (D/G) Livestock was assigned to the post of the project coordinator on a part-time basis. One of the directors or the D/G was assigned to the post

of P/M on a part-time basis in the early stage of the project, and later, a temporary officer was hired to the P/M's post on a full-time basis[1], as shown on Table 2-1. In total five officers were assigned or recruited for the post of the project Manager for a period of seven years and five months since the start of the project activities in February 2014 until project completion in June 2021. The full-time P/Ms (No. 2 and 5) had been in office only for three years and three months, whereas the D/G and Directors had taken over the additional charge of the P/M for the remaining four years and two months.

Table 2-1 List of P/Ms and Assignment Period

No	Name & Designation	From	To
1	Dr. Jamil Ahmed Shaikh (Additional Charge to the Director)	Commencement of the project	13-02-2017
2	Dr. Aslam Pervaiz Umrani (Full Time Basis)	14-02-2017	12-03-2018
3	Dr. Ali Akbar Soomro (Additional Charge to D/G)	13-03-2018	02-01-2019
4	Dr. Abdul Qadir Junejo (Additional Charge to D/G)	03-01-2019	29-04-2019
5	Dr. Mushtaque Hussain Jokhio (Full Time Basis)	30-04-2019	30-06-2020*

* Recruited with JICA budget from December 2020 to June 2021

The nine officers listed on Table 2-2 were assigned to the posts of their C/Ps on a full-time basis and continued their duties until project completion (eight officers that did not include the C/P Training/Extension were called "Technical C/Ps"). Some of the C/Ps were the C/Ps from the M/P Study, and had been engaged in JICA projects for more than 10 years.

The Department does not have the Directorate of Extension. Therefore, V/Os and S/As were recruited from the Planning Commission I (PC-I) budget in each pilot district to work as the extension team members under the project District Coordinator. In August 2016, two female V/Os joined the provincial project team to work on the posts of Gender Specialist (G/S) and Social Mobilizer (S/M), whereas five male V/Os and ten male S/As were recruited for the posts of M/Ts and E/Ws, respectively. All of these were recruited as temporary project staff who worked only during the project period.

Further, in May to September 2017, new project staff members including one V/O as Deputy Project Manager (DPM), one V/O and two S/As as Calf Salvation Center staff at the Provincial level, and 10 female V/Os as E/W at the District level, were recruited by the revised PC-I on a temporary basis[2].

[1] Dr. Aslam Pervaiz Umrani and Dr. Mushtaque Hussain Jokhio, the ex- and the last P/M were retired officers of the Department who had been recruited by the project as temporary officers.

[2] One M/T left the project during the project period. One male E/W was transferred to a different post and there were in total nine male E/Ws at the end of the project. One female E/W declined the officer due to the distance between the office and home. Two female E/Ws left the project during the project period. In the end, there were only seven female E/Ws.

Table 2-2 List of Full-Time Project C/Ps

	Ghullam Muhammad Jiskani	Farm Management		Safdar Ali Fazlani	Feeding Management
	Muhammad Arif Khan	Fodder Development and Production		Ali Akhtar Shahani	Livestock Reproduction
	Zulfiqar Ali Pathan	Animal health		Muhammad Mubarak Jatoi	Livestock Genetic Improvement
	Naeem Siddique Ansari	Livestock Assets		Iqtadar Ali Memon	Marketing
	Rukhsana Vighio	Training (Extension)			

2.4 Steering Committee

The project established the Steering Committee (S/C) as the highest decision-making body for project implementation. The S/C was chaired by the Secretary Livestock with participation of the Department key officers, JICA Pakistan Office, the project staff, and Japanese experts. As listed in Table 2-3, a total of 10 S/Cs were held during the project period to discuss important issues and to make decisions. The 1st S/C was opened with Dr. Hirashima's keynote address.



The 1st S/C

Table 2-3 Summary of S/C Meetings

S/C	Date	Major Discussion Topics
1	September 14, 2014	Dr. Shigemochi Hirashima's keynote lecture. Overview of the project. Overall project progress. Progress of livestock technology development.
2	May 28, 2015	JICA Office feedbacks to the project. 2nd year plan and progress. Issues and measures. Progress of livestock technology development.
3	May 26, 2016	Encouraging the Sindh Govt. to take actions for solving the issues. Project plan and progress. Preparation for the MTR Mission. PC-I revision.
Special	August 17, 2016	The MTR Mission explained to the project about the evaluation results and the recommendations. The committee discussed and agreed on the action plans for the recommendations from the Mission.
4	January 19, 2017	With attendance of the MTR Mission, the P/M explained the progress and prospects for the recommendations from the Mission and the discussion took place. The PDM Ver. 3 was explained. There was a serious concern about the progress of the Sindh Government and the Livestock Department's actions for issues such as the delay in project activities, so the Committee reviewed the progress and the prospects of improvement for each item of the Mission's recommendations. Dr. Kanameda, the Leader of the Mission, remarked that JICA would take such measures as stop dispatching Japanese experts or suspend project activities in case the issues were not improved within a certain period.
5	May 25, 2017	PDM Ver.3 explanation and approval. Presentation and discussion the 4th year plan for each Output.
6	December 13, 2017	Presentation on the 4th year progress and levels of achievement for the indicators of each Output. Challenges for enhancing the project sustainability. Suggestions and discussion on the restructuring of the Department. Feedbacks from JICA Office.
7	May 14, 2018	Presentation, discussion and approval of the 5th year project plan. Challenges and measures for enhancing project sustainability. Overview of the TE Mission and preparation. Feedbacks from JICA Office.
8	September 6, 2018	The TE Mission reported the Evaluation results and recommendations. The Committee discussed and agreed on the measures.
9	October 11, 2018	Progress of measures against the recommendations from the TE Mission (the action plan for both the project and the Department). Presentation, discussion on the work plan for the 5th year extension period (after February 2019). PDM Ver. 4 explanation and approval.
10	January 23, 2019	Presentation and discussion on the project activity plan for the period after February 2019 and the progress of the action plan. Handing over the project products and the equipment to the Department.

2.5 Inputs

2.5.1 Inputs from the Sindh Province Side

A summary of the Sindh Government's Annual Development Plan (ADP)[3] budget for this project and the actual expenditure is provided in Table 2-4. The original budget was in total 175.5 million Pakistani rupees (PKR) for five years. However, the budget was later revised to 227.06 million PKR according to the

[3] It is also called the PC-I budget. This is the budget specially allocated for the implementation of specific projects and does not include several cost items such as salary and allowance.

PC-I revision in 2017 (the actual expenditure amount was 216.97 million PKR).

Table 2-4 Sindh Government's Annual Development Plan Budget and Actual Expenditure

(Unit: Million PKRs)

Year	Phasing as per PC-I		ADP	Releases	Expenditure
	Original	Revised	Allocation	Total	Total
2013-14	43.6109	17.176	17.176	17.176	17.176
2014-15	27.4183	5.949	5.949	5.949	5.949
2015-16	30.4639	6.065	6.065	6.065	6.065
2016-17	34.7589	62.424	62.424	25.292	25.292
2017-18	39.2480	72.568	72.568	60.764	60.764
2018-19	0	62.879	62.879	47.385	47.385
2019-20	0	0	0	54.335	54.335
Total	175.500	227.061	227.061	216.966	216.966

(Source: Updated data on the Project Completion Report: PCR)

The budget expenditure by Sindh Government preceded the arrival of Japanese experts in Hyderabad (February 2014) and continued for seven years until the end of the 2019/20 fiscal year (June 2020). As shown in Table 2-4, only 29.19 million PKR were disbursed during the first three years, although a total of 114.9 million PKR had been budgeted in the original PC-I. This was mainly because procurement of project vehicles as well as recruitment of new project staff such as extension team members was delayed and did not happen until the 4th year. As a result, the disbursed amount increased sharply after the 4th year and reached approximately 217 million PKR (154.4 million Japanese yen: JPY[4]) at the end of seven years.

2.5.2 Inputs from the Japanese Side

(1) Japanese Experts

In total, 16 Japanese experts were engaged in project activities. This list is provided in Table 2-5.

Table 2-5 List of Japanese Experts

No.	Title	Name	Company
1	Team Leader/Institutional Development	Hiroshi Okabe	Kaihatsu Management Consulting, Inc. (KMC)
2	Deputy Team Leader/Marketing/Farm Management 2	Fumiko Ikegaya	KMC
3	Appropriate Technology Development 1	Hideo Tominaga	Tropical Livestock Consultant, Inc.
4	Feeding Management 1	Teruo Sugiwaka	Individual
5	Fodder	Shinsuke Kobayashi	Rural Development Institute Co.,Ltd.
6	Animal Health/Animal Reproduction 1	Kazuhiro Ono	Individual
7		Takeshi Abe	Individual
8	Animal Health/Animal Reproduction 2	Shigehisa Tsumagari	Individual
9	Genetic Improvement 1	Yoshitaka Nagamine	Nihon University

[4] JICA exchange rate for June 2021 (Rs.1 = JPY 0.711670) applied

No.	Title	Name	Company
10	Genetic Improvement 2	Yoshio Chiba	Individual
11	Feeding Management 2	Teruo Kawamura	Individual
12	Extension / Gender	Mika Kawamoto	KMC
13	Farm Management 1	Yukio Ikeda	KMC
14	Training Management	Haruka Ryu	KMC
15		Kodai Yugeta	
16	Appropriate Technology Development 2 / Coordinator	Noriko Hara	KMC

In addition to the above listed members, two below-listed short-term experts were dispatched to the project by JICA

- Feeding Management / Hood Cutting: Naofumi Tsukidate (Ministry of Agriculture, Forestry and Fisheries)
- Animal Health / Milking Hygiene: Masaharu Kanameda (JICA Advisor)

(2) Overseas Training

Table 2-6 shows a summary of all the overseas training courses.

Table 2-6 Summary of Overseas Training Courses

Year	Topic	Period	Venue	Name and Title of Trainees
2nd	Polymerase Chain Reaction method	July 6 to August 8, 2015	Animal Health Laboratory, National Agriculture and Food Research Organization	Dr. Parkash Dewani, Director, Central Veterinary Diagnosis Laboratory (CVDL)
4th	Current situation of livestock development in Thailand	May 13 to 21, 2017	Department of Livestock Development, Ministry of Agricultural Cooperative Other livestock organizations	All the nine full-time C/Ps (See Table 2-1)
4th	Feeding management and genetic improvement of dairy cows	August 20 to September 20, 2017	National Livestock Breeding Center (HQ and Iwate Farm)	Dr. Muhammad Mubarak Jatoi, C/P Dr. Safdar Ali Fazlani, C/P

In addition to the above training opportunities, the project invited a Bolivian livestock technician, Mr. Videz Roca Jose Nazario, who provided technical guidance on the reproductive function diagnosis of male buffaloes to C/Ps and local veterinarians.

1st Visit

Training Period: August 30 to October 7, 2015

Trainee: C/Ps in charge (Dr. Ali Akhtar Shahani, Dr. Naeem Siddique Ansari, Dr. Safdar Ali Fazlani)

2nd Visit

Training Period: August 27 to October 4, 2017

Trainee: C/Ps in charge, four District V/Os, one private veterinarian

(3) Donation of Equipment

The list of equipment donated by the Japanese side is provided in Attachment.

(4) Local Activity Costs

A summary of inputs from the Japanese side for the local activity cost, equipment cost, and sub-contract activity cost, is provided in Table 2-7 (The figure for the 5th year is the agreement price, instead of actual cost, because the 5th year was from March 2018 until September 2021). The project recruited temporary project members on a JICA budget because budget allocation by the Sindh Government was terminated as of June 2020. The 5th year agreement price includes the costs for their salary, daily allowance, and transportation fees for trips.

Table 2-7 Annual Local Activity Costs

(Unit: JPY)

Project Year	Fiscal Year (Japan)	Amount (before tax)
1	2013	37,403,000
2	2014	50,721,000
3	2015	48,462,000
4	2016	46,256,000
5	2017-2021 (Agreement amount)	54,543,000
Total		237,385,000

Chapter 3 Project Activities and Products

3.1 Levels of Achievement of Project Purpose

The project purpose is described below.

> The foundation for increasing incomes and assets of livestock farmers is built up in the pilot districts.
> (the foundation includes development of appropriate technologies, establishment of extension structure, strengthening concerned institution and capacity-building of concerned officers)

Table 3-1 summarizes the indicators for the abovementioned project purpose and the levels of achievement as of 30 June 2021.

Table 3-1 Project Purpose and Levels of Achievement

Project Purpose Indicators	Levels of Achievement
In the project districts: 1. More than 70% of the target group (excluding the pilot farmers) regularly use at least one of the nine "A" rank appropriate technologies shown in the attached Appropriate Technology Development Checklist as monitoring indicators within one year from training completion. Whereas, more than 50% of the target group continue to regularly use at least one of the same nine technologies even after more than one year from training completion. 2. All guidelines developed by the Project are officially acknowledged by the Livestock Department. 3. Some stakeholders (e.g. commercial farmers, NGOs, target groups) in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes. 4. The counterparts, extension workers and other staff including incumbent officers in the pilot districts have the capacity to support farmers according to the guidelines prepared by the Project 5. The Standard Operation Procedures (SOP) is implemented by the Department to apply the guideline of technology, the extension plan and materials prepared by the Project for the entire Department.	1. The monitoring survey revealed that more than 50% of the farmers who had participated in the training sessions conducted in the pilot or surrounding villages had been using the A-rank technologies even after one year or more after the training sessions. 2. All project guidelines for appropriate technology development, calf salvation, extension, and training were handed over to the Livestock Department in the 10th S/C held in January 2019. The training course was held in April 2021 with the objective of realizing the official acknowledgement of six SOPs by the Department. The succeeding process of a consultation meeting with key officers, the last S/C and the Secretary's approval on the official acknowledgement was originally planned for May and June 2021. However, this process did not proceed because the Japanese experts' trip was canceled; therefore, an online meeting was held on June 24, wherein it was confirmed that the Secretary would notify the Department officers regarding the official acknowledgement of the SOPs. 3. More institutions such as HANDS, Sindh Microfinance Bank (SMFB), and National Rural Support Programme (NRSP) have now started calf salvation activities, and the number of cases is thus increasing. NRSP combines the activity with their no interest microfinance (MF) service. Dry buffalo salvation is also continued by public and private veterinarians who received technical guidance from the C/Ps and who now continue reproductive disorder diagnosis and treatment of female buffaloes. Farmers now continue to rear pregnant dry buffaloes because their value is increased. Such cases are often confirmed. 4. Achieved. The C/Ps continue to provide support to farmers through their daily activities. They also train other Department V/Os and S/As as trainers. However, extension team members who had been hired as temporary staff left the Department because their agreement was expired. 5. Six SOPs were prepared to continue the project activities. The actual users of the SOPs that is, the C/Ps, Extension Team, and CBU, developed and still use these SOPs; it is thus expected that the Department will continue to effectively utilize the SOPs when it conducts the same activities.

According to Table 3-1, almost all the project purpose indicators have been "achieved" although some require further actions from the Department.

3.2 Prospect of Achievement of the Overall Goal

The overall goal of the project is described below.

> The appropriate technologies and the methods for utilizing livestock resources are adopted by the farmers in and outside the pilot districts

Table 3-2 summarizes the indicators for the above overall goal and the prospects of their achievement within three to five years from now.

Table 3-2 Overall Goal and Prospect of Achievement

Overall Goal Indicators	Prospect of Achievement
1. Appropriate technologies are disseminated to more than 3,000 livestock farmers in the project districts and more than 800 livestock farmers in non-pilot districts 2. More than 50% of target farmers regularly use at least one of the nine "A" rank appropriate technologies shown in the attached Appropriate Technology Development Checklist as monitoring indicators. 3. Some more stakeholders (e.g. commercial farmers, NGOs, target groups) in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes.	1. Contract of the Extension Team Members was completed as of May 2021. However, only Dr. Anisa, the Extension Team Leader, who is capable enough to continue the Department's extension activity, passed the recruitment exam for the Department's permanent officers. This indicator is achievable if the Department establishes the Directorate of Extension by restructuring and formulates the Extension Team again. 2. This is achievable if the Extension Team is formulated because the Department has already accumulated the know-how and produced results. 3. As mentioned above, the project Purpose was achieved by establishing calf and dry buffalo salvation technologies and models. The number of cases is expected to increase if the Department continues the public relations (PR) activities.

Because the project has already produced results and achieved the project purpose, the overall goal is very likely to be achieved if the same activities are continued under the same structure. In particular, the Department is expected to establish the Directorate of Extension and continue with PR activities for calf and dry buffalo salvation.

3.3 Output 0: Activities and Products

The project activities that are "common" and necessary for achieving the project Purpose and producing each Output are named as "Output 0". The main activities and results are described in the next section.

3.3.1 Activities

(1) 1st Year

1) Start of Activities in Pakistan

The project team concluded their contract with JICA on February 17, 2014, and arrived in Pakistan. The members in the 1st trip included Dr. Hirashima, Senior Advisor from JICA, and Mr. Okabe, Ms. Ikegaya,

Mr. Tominaga, etc. from the project team. The team visited the Japanese Embassy, JICA Pakistan Office, Islamabad. The team made courtesy calls to the Planning and Development (P&D) Department of the Government of Sindh, the Secretary of Livestock, the Consulate General of Japan, and Japan External Trade Organization (JETRO) Karachi Office from February 27, Karachi. Finally, the project team arrived in Hyderabad on March 2 and started the project activities by holding a kick-off meeting on March 3.

The P&D and the Secretary confirmed the disbursement of the budget for the project's local component (Rs.34 million for the 1st year). Furthermore, the Department fully accepted the JICA M/P study team's proposal on the C/P assignment, which was made while developing the PC-I for the project, and officially assigned nine officers to the C/Ps on the detailment base[5], which showed the Pakistani side's high commitment to the project[6].

2) Baseline Survey[7]

The baseline survey was conducted with the objective of understanding the technical levels of livestock farmers in the target area of the Sindh Province from various perspectives and collecting preliminary information for setting the project target indicators. Nielsen, Pakistan, was selected as a sub-contracted research company among three candidates through a bidding process. The agreement was concluded on May 22, 2014, with the period until the end of August.

The survey collected 200 samples of small and medium farmers (four villages) and 60 samples of cattle colony farmers. The presentation session by Neilsen was held on August 21. However, the project team decided to extend the agreement period because the survey results did not reflect the real situation and required collection of 200 more samples from four new villages. The project team strengthened the control of Neilsen by assigning two C/Ps to the Neilsen Team to check the translation of questionnaires into Sindhi, for training field surveyors, and accompanying the field surveys. On December 29, the project team received and accepted the survey results with much better quality.

3) Consultation Meeting and Steering Committee Meeting

On August 26, the 1st consultation meeting of the 1st year was held to increase the Department key officers' understanding of the project and to prepare for the 1st S/C on September 10. The D/G and Directors of each Directorate joined the meeting.

4) Development of the Project Leaflets

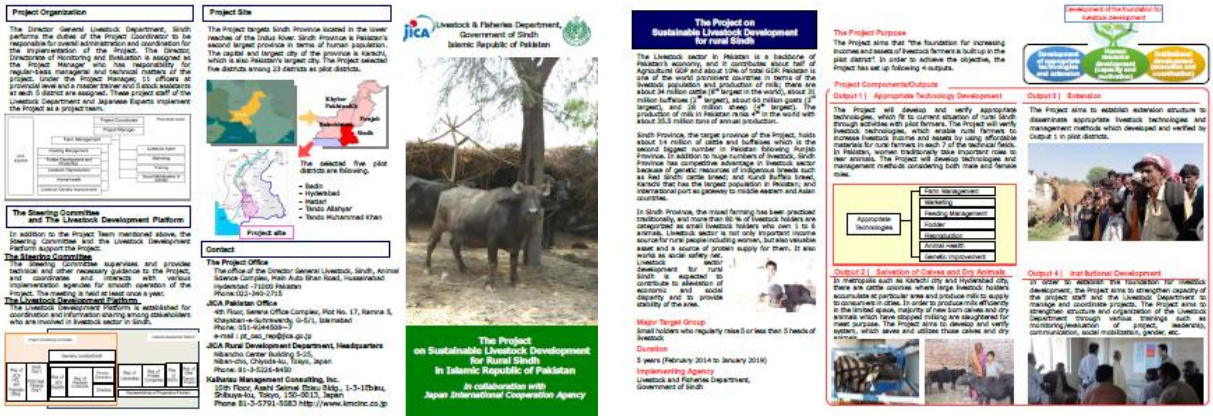
In June 2014, the project team submitted a draft version of Japanese and English leaflets to JICA. The team finalized the drafts by reflecting JICA's comments, and printed 200 copies of the Japanese version, 500 copies of the English version, and 500 copies of the Sindhi version. These leaflets were distributed at

[5] The officers assigned to the detailment base work exclusively for the project during the project activities while receiving salary from their original office.

[6] The level of commitment from the Pakistani side seemed high at the beginning of the project. However, as mentioned below, here were many cases in the later stages of the project, where it took a long time for the Sindh Government and the Livestock Department to take the necessary actions or where no progress was made at all

[7] The terms of reference (TOR) of the consultancy agreement between JICA and KMC defined the grasp of the capacity level of the Department officers as one of the topics of the Baseline Survey. However, to avoid confusion, this Section only refers to another part of the Baseline Survey that aimed to grasp the current situations of livestock farmers and cattle colonies.

the 1st Livestock Development Platform, held in January 2015.



5) Emergency Measures

As mentioned below, there was a huge delay in the process of appropriate technology development activities because of delayed recruitment of contracted staff members, the travel ban in August, and because the C/Ps, in their 1st year, were not familiar with their assignments given by the project. The initial schedule was to select 15 P/Fs in August 2014 and to start collecting weekly and monthly data while providing technical guidance. However, only 13 P/Fs had been selected by early November, and the project team decided to select the remaining 12 P/Fs in the 2nd year.

Because the aforementioned delay caused issues in data collection at P/Fs, the five F/Ps, who were district Department officers that had worked for the project when selecting P/Fs, were mobilized to also work for technical guidance and data collection at 3 P/Fs in each district for four days per week. The project covered their daily allowance and transport allowance (TA/DA) for this purpose.

6) Evaluation of the 1st Year and Planning of the 2nd Year

In January 2015, the project team and C/Ps jointly held a W/S for evaluating the 1st year (one day) and planning the 2nd year (half day). By holding this W/S every year, the project team aimed to build the C/P's project management capacity so that they could plan and implement the project more smoothly.

(2) 2nd Year

1) Consultation Meeting

In the 2nd year, the project team held three consultation meetings, inviting the D/G and Directors of each Directorate. The 1st consultation meeting was held on March 9, 2015, and discussed the possibility of establishing the project Task Force, as proposed in the 1st year, and the plan for the 2nd year's management training.

The 2nd Consultation Meeting was held on September 15, and shared the project progress and the issues of the Sindh Government that had prevented smooth implementation of the project. The meeting also explained and discussed the temporary extension plan, while the Directors mentioned the need for revising the PC-I.

The 3rd meeting was conducted on January 21, 2016. In this meeting, the training policies and implementation structure for the 3rd year project management training were discussed, as suggested by the

project team in the closing ceremony of the 2nd year of training held on the previous day.

2) Revision of PC-I

As mentioned above, in the consultation meeting held with the D/G and Department Executive Officer on September 15, the necessity of revising the PC-I was pointed out by several directors. On December 14, the project team discussed with Mr. Ajaz Ali Khan, Additional Chief Secretary (C/S) (Dev), Sindh Government, regarding the extreme delay in the actions to be taken by the Sindh Government, and received his official approval on the PC-I revision.

However, because there would be another opportunity to revise the PC-I in JICA's MTR Mission scheduled in August 2016, in the consultation meeting on March 31, 2016, it was decided to revise the PC-I only once and to perform all the revision works after completion of the MTR Mission.

3) Evaluation of the 2nd Year and Planning of the 3rd Year: Review of the PDM Ver. 1

As in the 1st year, on January 19, 2016, the project team organized a W/S among 17 persons including Japanese experts, the C/Ps, and national staff members to review the 2nd year's activities and to utilize the experiences for planning the 3rd year's activities. After reviewing the PCM Ver. 1, it was agreed that the PDM should be revised by the MTR scheduled in August 2019. In April, the project team discussed the revision and developed PDM Ver. 2.

(3) 3rd Year

1) Support on the PC-I Revision

The project team supported the Sindh Government and Livestock Department in their PC-I revision. The project team advised them to include the recruitment of a full-time P/M and a Deputy P/M because the project implementation structure was extremely weak, and also to include the recruitment of female extension workers along with the necessary budget for other activities, which were also recommended by the MTR Mission as mentioned below. Below is a summary of the major revision items of the PC-I.

a) Extension of the Sindh Government's project period until June 2019.
b) Changing the rule for enabling the recruitment of a full-time P/M from outside the Department.
c) Temporary employment of a full-time DPM
d) Temporary employment of other project staff members as listed below (25 persons in total)
   - ✓ Female extension workers (10)
   - ✓ Accountant Assistant (1)
   - ✓ Laboratory technicians (3): Two technicians in charge of fodder analysis at Poultry Research Institute (PRI) in Karachi, and one technician in charge of milk analysis at a mini-laboratory in the Department building in Hyderabad
   - ✓ Calf salvation activity (11): One para-vet, two calf attendants, one veterinarian, and two sweepers (total six persons) for operating the calf salvation center. One para-vet, two calf attendants, and two sweepers (total five persons) for another calf salvation center that was to be established in the nearby area.
e) Continuous allocation of the five F/Ps
f) TA/DA of the project staff: To be revised based on their previous performance and a future activity plan
g) Dry buffalo and calf salvation:
   - ✓ The Department will continue the calf salvation activity under the Sindh Government budget. The calf salvation center will rear 50 calves in the 4th year and additional 50 calves in a new center that will be established in the nearby area
h) Procurement of bulls for the Semen Production Unit (SPU) (Karachi): Three Kundhi buffaloes and three Red

Sindhi bulls will be purchased to obtain good semen.

i) Training for Department officers: A technical training course will be conducted in the project under the PC-I budget in addition to the project management training. The new training topics include appropriate technologies and extension methods (for veterinarians and para-vets in pilot Districts), training of trainers (ToT) for raising master trainers, refresher training for extension workers, and training for the capacity building unit (CBU) members.

j) Core farmer training: The project will support potential core farmers (including P/Fs) for exposure visits to other farmers, and vice versa, so that appropriate technologies will be disseminated from farmer to farmer.

k) Motorbike: The budget for purchasing one motorbike for one extension worker was already included in the original PC-I. However, this should be changed so that the motorbikes will be owned by the extension workers themselves, who will pay back Rs.2,000 per month

l) PR: The fee for participating in expos and other events for introducing the project activities should be included.

m) Model paddock: Equipment and materials for constructing a model paddock at one P/F in each district will be supplied for demonstration purposes

n) Equipment for the CBU office: Desks, computers, and furniture for the CBU office are included.

2) Support on the MTR Mission

The MTR mission visited the project in August 2016. The project team provided the necessary support to the mission as per its requests during the preparation period in Japan and the mission period in Pakistan.

3) Preparation for the Third-Country Training Course (Thailand)

		
Discussion with the Livestock Department (Bangkok)	Separated rearing of calves at a private buffalo farm (Chachoengsao Province)	Milk collection work at a dairy farming cooperative (Saraburi Province)

The third-country training course in India was originally scheduled in November 2016. However, this course was canceled because of several diplomatic reasons. Therefore, the project team changed the plan to conduct the course in Thailand in the 4th year. For this, Dr. Tominaga and Ms. Hara visited Thailand from October 24 to 27, 2016, and conducted a preparation survey together with Dr. Rangsun Parnpai, a Thai livestock expert.

4) Evaluation of the 3rd Year and Planning of the 4th Year

In December 2016, the project team organized a W/S to evaluate the activities of the 3rd year and plan the 4th year activities. This was the 3rd opportunity of having this W/S; thus, significant improvement in the C/Ps' understanding levels and in the quality of discussions was observed.

(4) 4th Year

1) Project Implementation Support

The project team frequently communicated with the Secretary Livestock and the P/M to encourage them to take action on the suggestions of the MTR mission and to promote the necessary actions after approval of the revised PC-I.

2) Evaluation of the 4th Year and Planning of the 5th Year

On November 30, the project organized a field trip to P/Fs and other farmers (extension target farmers) to evaluate the 4th year project activities and plan the 5th year activities. On December 4, a W/S was conducted to discuss observations from field trip. The Executive Director Animal Breeding, Director Planning and Monitoring, and other key Department officers also participated in the field trip and W/S because it had been decided that the whole process was to be conducted jointly with the project and Department (key officers and C/Ps) from the 4th year.

	
A participant is interviewing a core farmer in the field visit	W/S participants are discussing the Output 4 activities in group

(5) 5th Year

1) Support to the Livestock Department regarding Actions on Suggestions by the MTR Mission

Among the issues raised by the MTR mission four issues were remained unsolved until the beginning of the 5th year: i) allocation of a Toyota Single Cabin, ii) project allowance to the C/Ps, iii) extension of the project period, and iv) preparation of the Planning Commission IV (PC-IV) to regularize the project budget. After that, i) to iii) were all solved, and it was agreed that iv) should be done by the completion of the project. All required actions on the suggestions by the MTR mission were considered to have been completed (except for budget regularization).

2) Support and Follow-Up to the TE Mission

As mentioned above, the joint TE mission between JICA and the Livestock Department was conducted in September 2018. The project team supported the mission by providing the necessary information, arranging appointments with interviewees, accompanying field visits, and organizing and attending meetings as per requests from the mission. After completion of the mission, the project team clarified the necessary measures to be taken by the Department on the TE Mission's recommendations (an action plan) and encouraged the Department to take the required actions. After discussions with the TE Mission and the Department, the project team's proposal of "the measures for improving the sustainability after project completion" was fully incorporated into this action plan. The results of the follow-up are

described in Chapter 4 of this report.

3) Evaluation of the 5th Year and Planning of the Extension Period

On January 16 and 17, 2019, the Department officers were invited and a field visit (P/Fs and extension target farmers) and W/S were organized for confirming the farmers' situation, evaluating five years of project activities and planning of future activities. Officers from the P&D Department also joined the field visit and W/S. In the W/S, each C/P presented the progress in their own allocated fields, plans for the future, and issues for sustainability, followed by Q&A and group discussions on each Output. The discussion mainly focused on project sustainability issues.

4) Handing-Over the Project Products

Because the original project period was until January 2019, the project team handed over all the project equipment and products (except for a few[8]) to the Department at the 10th S/C. However, the project was extended after that; thus, the project team updated some of the products and re-submitted to JICA and the Department together with this report.

5) COVID-19 Impact Survey (Technological and Institutional Aspects)

From 2020 to 2021, the survey to identify the impact of COVID-19 on technological and institutional aspects was conducted through the following steps. The results and suggestions are described in Chapter 5.

- ✓ Objective: (1) To identify the impact of COVID-19 on project Outputs and (2) suggest necessary measures for maintaining project sustainability.
- ✓ Interviewee: Livestock farmers, Department officers, and E/Ws
- ✓ Interviewer: Eight technical C/Ps for livestock farmers, a national staff member for Department officers and E/Ws.

6) Project Completion

As mentioned earlier, the project completed its local activities in March 2020 and continued remote support to the C/Ps with the policy of "do what we can do." On June 24, 2021, an online meeting was held between the project team, Deputy Secretary Livestock, D/G, and other Department key officers to discuss how the Department will be able to continue the project activities independently, which was the last activity to conclude the project.

3.3.2 Products

Table 3-3 lists technical cooperation products for Output 0[9]

[8] All remaining products were handed over to the Department in June 2019

[9] Project deliverables are reports and technical products that are defined by the consultancy agreement between JICA and KMC. The same applies to this whole report.

Table 3-3 List of the Technical Products of the Project

Type	Title	Submission Year	Contents	Attachment No.
Baseline Survey Report	Survey on Target Farmers' Current Situation	1st year	Technical levels of 200 small and medium size farmers in four villages (two pilot villages and two non-pilot villages)	T0-1
	Survey on Cattle Colony Farmers' Current Situation	1st year	Technical levels of 60 farmers in the cattle colonies (two colonies in Karachi and two colonies in Hyderabad)	T0-2

Table 3-4 lists other project products[10] for Output 0.

Table 3-4 List of the Other Products of the Project

Title	Submission Year	Contents	Appendix No.
Project Leaflet	1st year	Japanese version	Z0-1
Project Leaflet	1st year	English version	Z0-2
Project Leaflet	1st year	Sindhi version	Z0-3
COVID-19 Impact Survey Report (Institutional Side)	5th year	Identified the impact of COVID-19 on the institutional side of the project	Z0-4
COVID-19 Impact Survey Report (Technical Side)	5th year	Identified the impact of COVID-19 on the technical side of the project	Z0-5

3.4 Output 1: Activities, Products, and Levels of Achievement

3.4.1 Activities

(1) Activities with P/Fs (1st Year)

The main activities of the 1st year were to select P/Fs and develop appropriate technologies for the following seven target fields: i) farm management, ii) marketing, iii) feeding management, iv) fodder, v) animal reproduction, vi) animal health, and vii) genetic improvement.

1) Setting up a Structure for Technical Guidance

Nine full-time C/Ps were assigned. Each of them was responsible for farm management, marketing, feeding management, fodder, animal reproduction, animal health, animal assets, and training. A Japanese expert developed a draft activity plan with the C/Ps and national staff members. On March 24, 2014, they started to visit the district offices of the Livestock Department in five pilot districts to meet the officers and agree on the activity plan.

2) P/F Selection and Criteria

The number of P/Fs in the 1st year was planned to be 15 and increased by 10 in the 2nd year, making a total 25 (five per District). The Japanese expert and C/Ps agreed on the following selection criteria.

Defining Farmer Size by Land Size

The project defined small-scale farmers as those who cultivated up to five acres (two ha) of land, and medium-scale farmers as those who cultivated more than five and less than 20 acres (eight ha) of land. Micro-scale farmers who cultivated less than 2.5 acres were included in the category of small-scale

[10] Other project products include all the project products except for technical products. The same applies to the other Outputs.

farmers. Large-scale farmers were those who cultivated more than 20 acres of land, whereas extremely large-scale farmers are those who cultivated more than 500 acres of land.

Animal Unit for Evaluating Dairy Scale

The project used the concept of Animal Unit (AU) to evaluate the farmers' dairy scale. The main reason was to select as many small-scale farmers who owned three milking buffaloes (including cattle) as possible.

Ratio of Small-Scale and Medium-Scale Farmers

The project decided to limit the ratio of medium-scale farmers to 30%. Therefore, the project selected 18 small-scale farmers and seven medium-scale farmers.

Ratio of Farmers Who Have Their Own Land

The ratio of farmers who had their own land was limited to 30% in both small-scale and medium-scale farmers.

3) P/F Selection Process

Before selecting the P/Fs, the project selected pilot villages according to the results of a questionnaire survey. The project then categorized the farmers into seven categories (e.g., non-farmers doing small-scale dairy farming, medium-scale farmers who own medium-scale land, etc.) according to the abovementioned selection criteria. A list of P/F candidate farmers for each of the seven categories was then prepared. The project sought advice from the village heads, community leaders, teachers, and other influential persons from the villages to consider factors such as biradari, religion, the number of milking and dry animals, the farmer's ownership of land, area of their own land, educational background, place of residence, channel of selling milk, attitudes, and motivation. The project also conducted a questionnaire survey, an interview, and field guidance to candidate farmers, and finally selected 12 P/Fs[11].

	
A P/F's paddock before project assistance (At Mr. Najamuddin's farm)	A P/F's paddock before project assistance (At Mr. Ramzan's farm)

4) Developing the Appropriate Technology Development Plan and Guidelines

The project team developed the 1st year appropriate technology development plan through exchange of opinions between P/Fs and C/Ps. The basic policy is described below.

- ✓ The 1st year's main goal is to increase milk production and income of the farmers.

[11] Fifteen farmers were selected initially but three farmers declined the offer later.

- ✓ Milk production increases are achievable only if various fields of dairy farming, such as feeding management, fodder, animal health, reproduction, and animal capacity (genetics) are improved. Three of the fields that can show results in a short period of guidance are feeding management, fodder, and animal health.
- ✓ Reproduction and genetic improvement are mid-term goals to be achieved after four to five years.
- ✓ Increased income greatly depends on an increase in sales price; therefore, the project will develop an appropriate model to improve livestock marketing and other fields.

5) Weekly Interview and Monthly Measurement Plan

The project decided to conduct weekly interviews and monthly measurements at P/Fs to the monitor changes and improvements in the P/F's economic and technical levels. Because of the delayed schedule of weekly interviews, the project requested the Department to mobilize the F/Ps as a temporary measure.

6) Appropriate Technology Verification

Dr. Tominaga, a Japanese expert, coordinated the activity of each C/P and initiated the process of appropriate technology verification. Before this, Dr. Tominaga developed a draft version of the Appropriate Technology Development Guidelines and applied it to activities with P/Fs. The project held a regular meeting every Friday to discuss the weekly progress and to finalize the next week's plan and activity schedule.

Each field's activity is summarized below.

a) Farming: To understand the current situation of the farmers' livestock businesses through weekly interviews, particularly, the fodder cost, fodder provision situation, transfer of animal assets, and profit and loss from dairy products.
b) Marketing: To summarize the current situation and issues related to milk marketing and install milk fat analysis equipment at the project office.
c) Feeding management: To install an iron pipe-made facility that enables easy body weight measurement, ear tagging, vaccination, deworming, reproductive disorder diagnosis by rectal palpation, and pregnancy diagnosis at one farm per district (five farms in total).
d) Fodder: To develop a formula feed model to increase milk production, and provide technical guidance on fodder and soil sampling.
e) Reproduction: To conduct a survey on the current situation of female and male calf reproduction with the objective of improving the conception rate and shortening the pregnancy intervals, and to provide technical guidance on rectal palpation by a Japanese expert.
f) Animal health: To conduct a fact-finding survey for decrease the disease and mortality rates through vaccination and deworming of internal and external parasites based on the appropriate annual animal health calendar; to develop an appropriate quarantine model in coordination with the CVDL of the Livestock Department after conducting research on brucellosis and tuberculosis; and to conduct vaccination against foot-and-mouth disease and hemorrhagic septicemia (HS).
g) Genetic improvement: To conduct a survey of the current situation of animal genetics; to decide methods for Kundhi buffalo pedigree registration, to initiate registration at 10 breeders; to begin milk production tests; and to develop an ear tag.

(2) Activities with Non-P/Fs (1st Year)

The project conducted the following activities with non-P/Fs.

1) Fodder Analysis at PRI

The project decided to request the PRI of the Livestock Department in Karachi to perform a fodder analysis for evaluating the fodder nutrition value and soil physicochemical properties. There were concerns such as old equipment, formula errors, and inappropriate amounts of reagent, but the project considered that these could be improve by technical guidance from Mr. Kobayashi, a Japanese expert. The project provided the most important equipment, including a pH meter, spectrophotometer, nitrogen digestion apparatus, nitrogen distillation apparatus, Soxhlet abstractor, and cutting mill to the Department for free.

2) Collaboration with Sindh Agriculture University and Engro Fertilizer

The project visited the Department of Animal Nutrition, Faculty of Animal Husbandry, and the Department of Soil Science, Faculty of Crop Production, at Sindh Agriculture University. The latter Department collaborated with Engro Fertilizer Co., which the project asked for soil analysis. The Department's test and research results on fodder production in the project target area were effective for the project's appropriate technology development activity. The former Department was expected to exchange technologies for the use of roughage with the project.

A Kundhi Buffalo

3) Genetic Improvement

The objective of the genetic improvement of the project was to introduce bulls of good breed into the pilot villages on a trial basis to verify a livestock improvement model. As a result, it was expected to improve the breeding capacity of the herds in the pilot villages.

The project ear-tagged female buffaloes at breeder farms that reared good pure breed buffaloes to identify individual buffaloes and performed pedigree registration and milk production tests. The project selected good mother buffaloes (elite female buffaloes) based on these results. The project then selected or produced male buffaloes that were assumed to be superior based on the capacity of their mother and family. The project distributed the male buffaloes to pilot villages and used these buffaloes for natural mating as bulls. Under this principle, the project initiated activities with the Sindh Livestock Breeders Association, District Matiari.

(3) Activities with P/Fs (2nd Year)

1) Additional P/F Selection

Based on the results of questionnaires to farmers, the project selected 25 small-scale farmers from 73 farmers and two medium-scale farmers out of six farmers as candidate P/Fs. The project then visited and interviewed 27 farmers and decided on selecting 13 additional farmers.

2) Weekly Interview, Monthly Measurement, and Appropriate Technology Verification at P/Fs

The same activities continued from the 1st year. The main activities of each technical field are described below.

a) Farm management

The project confirmed the weekly farm management data and entered these data into a database, which had been started in November 2014. An inventory was prepared by counting the number of heads in monthly measurements to utilize the data for livestock business analysis.

	
Taking inventory (Counting the number of heads)	Data entry

b) Marketing

<u>Weekly and monthly interview</u>

The project collected information on the milk production volume, milk self-consumption volume, milk sales volume, milk sales price, and milk sales channels of the P/Fs through weekly interviews. The project also collected information on milk purchasing volumes, milk purchasing price, milk sales volumes, and milk sales price of milk retail shops and tea shops near the P/Fs.

A joint W/S with Engro Foods

The project discussed with Engro Foods, a milk company that collected milk from the pilot districts, on possible collaboration in the future. Consequently, the project organized a W/S on sales channel increase jointly with Engro Foods at a pilot village in Badin.

Milk wholesale and retail prices were determined by the district authorities in urban areas such as Karachi and Hyderabad. The project investigated how these prices were determined.

c) Feeding management

<u>Installation of milking sheds and paddocks</u>

The project designed a simple-roof and brick-floor milking barn for producing hygienic milk and installed barns together with paddocks at three P/Fs.

	
A milking shed and paddock at a P/F, Ms. Saleha's farm	A milking shed and paddock at a P/F, Mr. Razzak's farm

Wooden retainer

The project installed wooden and cloth-made retainers at eight P/Fs and eight breeder farms, i.e., a total of 16 farms, to enable easy body weight measurement, rectal palpation, and treatment for animal reproduction activities, and disease prevention and treatment for animal health activities.

	
Body weight measurement using a wooden retainer	A carpenter cuts an edge of a rectangular timber using an electric plane

d) Fodder

Trial feeding with formula feed

The project team prepared a formula feed for milking buffaloes using several varieties of concentrate feed that were locally available throughout the year. The project started the trial feeding of formula feed at the P/Fs to verify a milk production increase in January 2015.

In May 2015, the project conducted a mid-term evaluation of the results from Mr. Pehlaj, who was the first P/F that had started feeding the formula feed. The results showed a remarkable increase in milk production. Figure 3-1 shows the weekly milk production volumes. In mid-December 2014, Mr. Pehlaj started to feed cotton seed cake and wheat bran at his own expense and reported increased milk production. After that, in mid-January 2015, Mr. Pehlaj started providing the formula feed obtained from the project. The production volume then showed a stepwise but remarkable increase until late February. Figure 3-2 shows the

comparison between a normal milk production curve and the milk curve obtained after formula feed provision (lower right). Formula feed provision began at the middle of the lactation period, which normally shows a decrease in milk production. The results proved that a normal milk curve that peaks after two or three months could be achieved if the appropriate formula feed was provided by proper feeding management. The hatched area in Figure 3-2 indicates the estimated quantity of milk production loss.

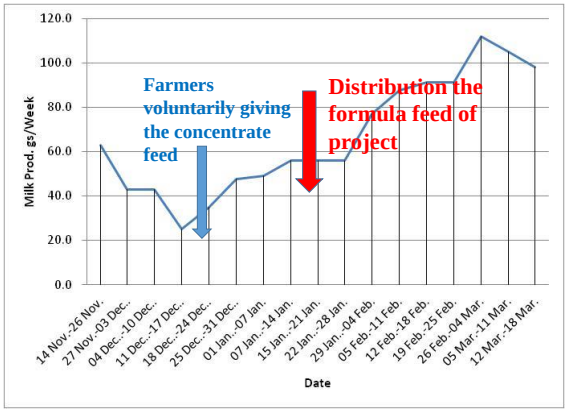


Figure 3-1 Milk Production Started to Increase in the Middle of January

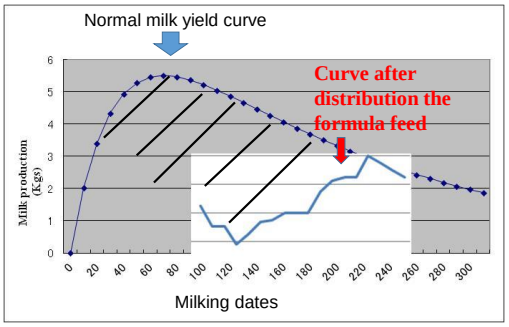


Figure 3-2 A Normal Milk Production Curve and a Curve Obtained after Formula Feed Provision

e) Animal reproduction

Enabling conception as early as possible after delivery is essential for increasing the lifetime milk production volume of a milking buffalo as well as the farmers' income. To improve the conception rate, it is essential to train technicians who can perform correct reproductive diagnoses and treatment. Under guidance from the Japanese experts, the C/Ps improved their diagnostic and treatment skills, practicing with male buffaloes at the P/Fs. In June 2015, the project organized a training course on reproductive disorder diagnosis and treatment for ten veterinarians

f) Animal health

The project provided technical guidance on vaccination, deworming, and mastitis tests to prevent disease. The project also developed a plan for conducting brucellosis tests.

g) Genetic improvement

The project started pedigree registration and milk testing in non-pilot villages to identify elite mother buffaloes. After identifying these buffaloes, the project planned to identify a good bull from her son or brother buffaloes and to introduce these bulls into pilot villages. The project team's idea was to request a landowner to purchase the bull or to provide the bull to a farmer group and request the group to take care of the bull.

(4) Activities with Non-P/Fs (2nd Year)

1) Fodder

The project continued technical guidance on fodder analysis to PRI officers and encouraged the Department to establish a laboratory environment with its own efforts.

2) Animal Reproduction

The main objective of reproduction guidance is to improve the conception rates of buffaloes. The project organized the below-mentioned training courses to technicians for two important topics of reproductive disorder diagnosis and treatment of female buffaloes, and of reproductive diagnosis of male buffaloes to improve the levels of bull screening and selection.

a) Reproductive disorder diagnosis and treatment of female buffaloes

The project selected nine Department officers and four private veterinarians through interviews. From June 2 to 15, 2015 (14 days), the project conducted the training course with 11 of 13 selected candidates. Dr. Ono, a Japanese expert, delivered the theoretical lectures (on diagnosis by rectal palpation, early pregnancy diagnosis, heat detection, reproductive organ structure, heat cycle control and adjustment using hormones, basic reproductive treatment, and disinfection of equipment and tools), and demonstrated techniques (organs and rectal palpation).

	
Practicing palpation techniques by using organs	Rectal palpation guidance at a slaughter house

b) Reproductive diagnosis of male buffaloes

The project invited a Bolivian technician, Dr. Videz Roca Jose Nazario, as a third-country expert from South America, who provided technical guidance for 39 days from August 30 to October 7, 2015.

Dr. Videz provided theoretical lectures and practical training to the three C/Ps, Dr. Shahani, Dr. Naeem, and Dr. Safdar. Technical guidance included checking the outer appearance of bulls (the hoof, limb, eyes, teeth, penis, and scrotum), palpating the epididymis, measuring the scrotum and tail of the epididymis, examining reproductive organs by rectal palpation, and inspecting semen. They performed diagnosis for a total of 60 buffaloes (29 adult buffaloes and 31 calves).

		
Technical guidance on reproductive diagnosis of male buffaloes	Measuring the outer circumference of the epididymis	Extracting semen by massaging

c) Research on reproductive physiology

Sample collection and analysis

Dr. Tsumagari, a Japanese expert, visited Sindh Agricultural University on August 25 and 27, 2015, to discuss the possibility of collaborative research. However, because many issues regarding appropriate sample collection were confirmed, the project decided to conduct sample collection and analysis at the CVDL of the Department.

Research

Insulin-like growth factor (IGF-1) is a polypeptide growth factor. The blood level of IGF-1in a buffalo is an indicator of its nutrition levels. It is known that a buffalo does not go into heat when the IGF-1 level is low, whereas it goes into heat when the IGF-1 value is improved and the follicles grow. Therefore, the IGF-1 value is used to project the recurrence of heat and as a basic indicator to improve feeding management. The project started a monthly collection of blood samples in March 2016 in the 3rd year. After collecting the samples, the project separated and cryopreserved serum to perform enzyme-linked immunosorbent assay (ELISA) and to provide technical guidance at a CVDL laboratory after Dr. Tsumagari would make his next visit to Pakistan in August 2016. The total sample size was 116, which was 96 (eight heads × 12 months) plus 20 collected from P/F buffaloes. The project purchased three sets for IGF-1 analysis kit.

Technical guidance for ultrasound analysis

Certain levels of rectal palpation skill are required for conducting an ultrasound analysis of the reproductive organs of buffaloes. The project planned to first improve the rectal palpation skills of C/Ps and then provide training in ultrasound diagnosis skills. Dr. Tsumagari provided technical guidance to two C/Ps, Dr. Shahani and Dr. Naeem, using reproductive organs brought from a slaughterhouse.

	
Practical training on the ultrasound diagnosis of organs (1)	Practical training on the ultrasound diagnosis of organs (2)

3) Animal Genetics

a) Kundhi buffalo pedigree registration

The project continued ear-tagging and collecting the basic data of new target buffaloes for pedigree registration. The project also recorded the data on the reproduction (mating and delivery) and transfer (death, sale, and purchase) of buffaloes. The project then installed a pedigree registration software developed by the Japan Holstein Registration Association in June 2015, but this did not function properly. The project re-installed the software in late November and confirmed that the software functioned properly.

b) Technical guidance on linear classification of Kundhi buffaloes

To determine the features of Kundhi buffaloes, the project collected body scale data and provided technical guidance on the linear classification and proper body measurement techniques to C/Ps.

		
Measurement of body height	Measurement of heart girth	Measurement of waist angle width

c) Establishment of the Kundhi pedigree registration association

Concerned about the progress of Kundhi pedigree registration and milk testing, Mr. Ali Hyder Shah expressed his intention to establish the Kundhi Pedigree Registration Association. The Department prepared an office for genetic improvement activities within the Department building, which was utilized as a temporary association office. In preparation for establishing the association, Mr. Ali started visiting and exchanging opinions with breeder farmers in September 2015, while developing the draft articles of the association.

(5) Activities with P/Fs (3rd Year)

1) Appropriate Technology Selection

Based on the results regarding 15 months of verification at 12 P/Fs selected in the 1st year, the project team, including C/Ps, started to select the appropriate technologies. The project agreed on the prerequisite for appropriate technologies, which was to have a high effect on "milk production increase and income increase" The project temporarily selected the appropriate technologies in June 2016 and finalized this list of technologies in October 2016.

As Table 3-5 shows, the number of selected appropriate technologies was 50, and 24 of 50 of these were feeding management technologies. In addition to the appropriate technologies, the project also selected 32 useful basic technologies that were considered difficult to achieve in the remaining project period but were essential for building up the livestock foundation in future.

Table 3-5 Number of Appropriate Technologies and Useful Basic Technologies

Area	Appropriate Technologies	Useful Basic Technologies	No.
Farm management	3	3	6
Marketing	3	1	4
Feeding management	24	8	32
Fodder	5	5	10
Animal Reproduction	3	7	10
Animal Health	9	3	12
Genetic improvement	3	2	5
Animal Assets	0	3	3
Total	50	32	82

Table 3-6 Number of Appropriate Technologies by Rank

Rank	No.
A	20
B	22
C	8
Total	50

The appropriate technologies were ranked as A, B, or C. As Table 3-6 shows, the numbers of A, B, and C rank technologies were 20, 22, and eight, respectively. The definition of each technology rank is as follows.

A: Highly effective and easy for farmers to apply

B: Highly effective but not easy for farmers to apply

C: Moderately effective and not easy for the project to provide guidance and for farmers to apply during the project period

The A rank technologies were the main targets of technical guidance for farmers in the remaining project period. The B and C rank technologies were those technologies on which the project would accumulate experience through continuous verification at P/Fs. Initially, 20 technologies belonged to the A rank, but two similar technologies of bathing and showering were later merged into one, to make the total of 19 A rank technologies. The project decided to conduct an interview survey (baseline survey) for collecting data on the current situation of farmers' practices of A rank technologies when starting the farmers' training in villages. The project would then perform the same survey later at an appropriate time to identify how many farmers had understood and used the appropriate technologies. The A rank technologies are thus indicators used to evaluate the results.

2) Farm Management

The project trained C/Ps so that they could prepare financial statements by themselves. The main training topics are as follows.

- ✓ Weekly data screening and correction
- ✓ Asset value calculation: Decided different appraised values for buffaloes of different ages, followed by asset value calculation.
- ✓ Preparation of financial statements (balance sheet, profit-and-loss statements, and cash flow statements) of four P/Fs (Mr. Pehraj, Mr. Abdul Razzak, Ms. Saleha, Mr. Mushtaque Ali).

The C/P also conducted a comparative analysis of the financial and technical aspects of dairy farm

management by Ms. Saleha in TA District. The results of fodder analysis are presented below.

The total quantity of annual concentrate feed provision by Ms. Saleha was 6,387 kg. The total milk production was 1,885 kg. Thus, by feeding one kg of concentrate feed, her buffaloes produced 0.3 kg of milk. The project provided her with 1,860 kg of formula feed on a trial basis. The milk production of buffaloes fed the formula feed was 1,614 kg. Thus, by feeding one kg of formula feed, her buffaloes produced 0.86 kg of milk, demonstrating a higher effect of formula feed on milk production. Table 3-7 shows the results.

Table 3-7 Feed Effect

	Milk production (kg)	Feed fed (kg)	Effect of feed
Concentrate	1,885	6,387	Feed 1 kg ⇒ Milk 0.3 kg
PSLD formula feed	1,614	1,860	Feed 1 kg ⇒ Milk 0.86 kg
Total	3,499	8,247	Feed 1 kg ⇒ Milk 0.42 kg

3) Marketing

The project continued weekly interviews and monthly measurements from the 2nd year. The project identified and analyzed several models of successful marketing cases. Based on the results, the project organized a marketing W/S for raising the farmers' awareness and compiled a list of necessary technologies for hygienic milk production in Textbook for Appropriate Technology of Dairy Farming for Livestock Technician. The C/P in charge of marketing accompanied a trial of farmers' training organized by the extension team to improve the extension materials.

4) Feeding Management

The project involved the C/P in charge of fodder for feeding management activities and together provided technical guidance and follow-up to farmers on how to improve the milk production and body weight of young buffaloes. Feeding management-related technologies accounted for half of the 50 appropriate technologies selected. The textbook of Appropriate Technologies for Dairy Farming included feeding management technologies before and after delivery so that the C/Ps could provide technical guidance to farmers.

a) Changes in training policy

There were many cases where farmers did not milk buffaloes at the newly installed milking shed but at a barn where they used to do so previously. There were also many cases where farmers tied buffaloes to a paddock with a rope, even though the project had installed the paddock to allow the buffaloes to move and drink. Therefore, the project changed the guiding policy so that it would focus more on improving the traditional mooring practices, which were relatively easy to improve.

b) Hoof-cutting

The project planned to utilize the strength of traditional hoof-cutting techniques and to complement the weaknesses with Japanese hoof-cutting techniques. The project invited five local hoof-cutting technicians to provide a Japanese expert, Mr. Tsukidate's DVD lectures on Japanese hoof-cutting techniques, and special clothes. Subsequently, Mr. Tsukidate demonstrated Japanese hoof-cutting techniques (single retainer-type and simple retainer-type) to the P/Fs. Mr. Tsukidate also trained three hoof-cutting technicians in a pilot village in the TMK District.

		
Mr. Tsukdiate explains hoof-cutting tools and clothes	Cutting of foreleg hooves using a retainer	Single retainer hoof-cutting technique

c) Installation of a newly made MS pipe retainer

The project developed a model iron pipe race in the 2nd year, but this required welding work for the installation and cost a lot (Rs.140,000). The project next developed a new model of a wooden retainer that was easy for the C/Ps to install with the help of farmers and was also less expensive. However, wood was too heavy for the construction work. The new model of the mild steel (MS) pipe retainer was made of iron pipes that were often used for scaffolding at construction sites, so it was easy to install and less costly. The project installed a total of 18 MS pipe retainers, 13 at new P/Fs, three at new breeders, and two at commercial farms in cattle colonies.

A completed MS pipe retainer

5) Fodder

a) Trial feeding of formula feed for milking buffaloes

The project analyzed the data of 14 milking buffaloes from the 1st group that completed 305 days of their lactation period.

The average milk production confirmed as a result of trial feeding in 2016 was 2,620.4 kg, whereas the average daily gain was 8.6 kg, both of which were close to the average of commercial farmers in the cattle colonies. As the average daily milk production of buffaloes reared in rural Sindh was four kg, the results of trial feeding proved that buffaloes in rural areas could produce a good quantity of milk if fed with good quality formula feed.

b) Feed supplier information collection

The project continued trial feeding at P/Fs and provided formula feed for two calves per P/F for free. The project planned to start providing formula feed for some fees from the 4th year, so the project visited three companies that produced formula feed for poultry and then decided to ask Habib Feed for producing formula feed for dairy farming.

c) Milk production of buffaloes from commercial farmers in the Hyderabad cattle colony

The project analyzed the milk production data of 117 milking buffaloes of Mr. Haj Amir from December 2010 to June 2012. According to the results, the average milk production was 2,511.76 ± 620 kg. The average milk sales price from January to November 2010 was Rs.63.26. Multiplying this by the average milk production of 2,512 kg yielded Rs. 159,000. Because the rearing cost was Rs. 100,700/head, there was a profit. The daily cost of feed/head was Rs.210.6, which accounted for 60% of the entire cost, so that the farmer could compensate for the feeding cost if four kg/day of milk was produced.

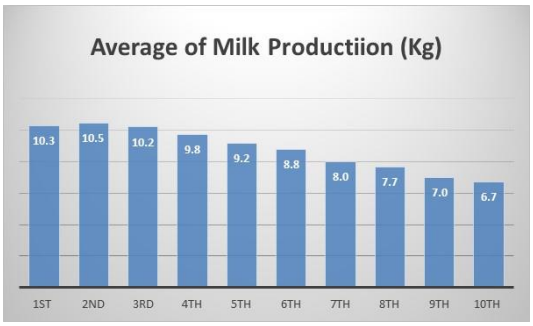


Figure 3-3 Milk Production Curve

d) Fodder analysis at the PRI's laboratory

The project began its analysis in November 2016. The Japanese fodder expert provided technical guidance regarding fodder to the C/P on sample cutting, general analysis procedures (moisture, crude protein: CP, crude fat, and crude ash), and fiber analysis methods. The project analyzed six fodder varieties.

The Japanese expert developed the 4th year fodder analysis plan (target fodder for analysis, roughage sampling by growing stage, etc.) that mainly targeted roughage and shared it with the C/Ps. The expert also developed a fodder crop yield survey plan table and provided technical guidance on the proper fodder sampling methods.

The project visited the Department of Soil Science at Sindh Agriculture University to collect information on the zinc content of rice. The project team learned that the zinc content of straw is low because the rice cultivated on alkaline soil (including saline soil) in Sindh Province cannot absorb enough zinc. The zinc levels are thus far below the requirement of milking buffaloes, which can negatively affect the growth, immunity, and reproduction of large ruminants such as buffaloes because of zinc deficiency.

6) Animal Reproduction

a) Reproduction results of the P/Fs' buffaloes

The project analyzed the monthly data on the number of deliveries and estrus cases. Figure 3-4 shows the results of the analysis. Most delivery cases were concentrated during the seven months between May and November. Because the average pregnancy period of a buffalo is 310 days, it can be said that conception often occurred during the seven months between January and July. The average delivery interval and the first delivery age of the P/F buffaloes are described below.

* The delivery interval was 19 months ± 3.2 months (more than nine months pass between delivery and conception)

＊ First delivery age: 42.8 months ± 4.7 months

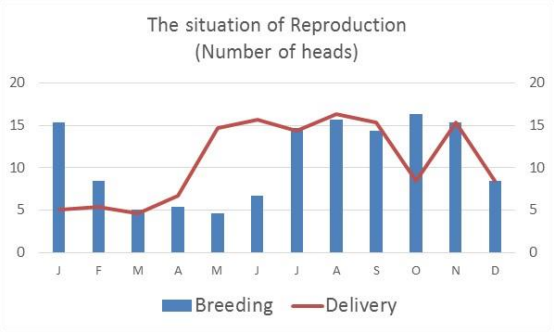


Figure 3-4 Number of Breeding and Delivery Cases by Month

b) Reproductive diagnosis of female buffaloes by rectal palpation

Dr. Takeshi Abe succeeded Dr. Ono in the 3rd year. Dr. Abe continued providing technical guidance on the diagnosis of reproductive disorders by rectal palpation and treatment. The C/Ps performed diagnosis in 586 buffaloes at two years and two months, and were able to palpate even very small ovaries in a difficult position. The C/Ps also improved their ability of inject medicine into the uterus. However, they were still not at the level of making a proper diagnosis of the corpus luteum and follicle through comprehensive judgment. The project thus decided to continue technical guidance on diagnosis by rectal palpation and on proper recording using diagnosis cards.

c) Reproductive treatment

The Ovsynch method and controlled internal drug release (CIDR) methods are reproductive techniques that can be easily performed without rectal palpation. The project team treated 50 buffaloes using the Ovsynch method and confirmed eight estrus cases (80%) and five conception cases (50%). The rate of conception cases over the treatment cases was 63%. The project treated 11 buffaloes using the CIDR method and confirmed seven estrus cases (67%) and five conception cases (46%). The rate of conception cases over the treatment cases was 71%. Both methods yielded relatively good results.

d) Reproductive physiology survey plan

According to the P/F reproduction records, most estrus cases were confirmed during the rainy season from July to November. The main reasons for this were assumed to be nutrition and hot weather. The IGF-1 value is used as a nutritional condition indicator and correlates with the buffalo's body condition score (BCS). A lower BCS score resulted in a lower IGF-1 value. It is known that an animal does not go into heat if the IGF-1 value is below a certain level (this also depends on the animal variety).

The survey aimed to identify ways to improve the nutrition conditions of buffaloes, the levels of BCS that would induce appropriate estrus, and methods of knowing the proper mating times to increase the conception rate. Under Dr. Tsumagari's guidance, the project performed IGF-1 analysis of 20 samples from four buffaloes using ELISA, and blood physiology tests for three parameters (blood urea nitrogen: BUN, total cholesterol: T-chol, and total protein: TP) at a private blood testing laboratory. With the results of the analysis, the project continued to analyze the correlation between "nutrition conditions, analytical values, and estrus."

		
Technical guidance on ELISA analysis	Exchanging opinions on the analysis results	Technical guidance

7) Animal Health

a) Disease prevention

Under the slogan of 'Prevention first, then treatment!' The project continued to verify the results of regular vaccination and deworming of internal and external parasites at breeders who had been cooperating with the pedigree registration and milk testing activities. The number of buffaloes with the foot and mouth disease vaccine was 902, while that with the HS vaccine was 1,413. There were no cases of disease after vaccination. Overall, 4,774 and 412 buffaloes were respectively treated with oral deworming and ivermectin injection, which also showed high prevention results.

b) Promotion of sterilization and disinfection

The project launched a slogan of "one needle for one animal" to improve the farmers' awareness regarding the importance of disinfection. The project encouraged farmers to always change a needle every time when they would treat and vaccinate a new animal, and to disinfect the syringes used for vaccination and treatment, the apparatus for injecting medicines into the uterus, and the hands that entered into the vagina when helping with delivery.

c) Disease treatment

The project provided emergency aid medicine kits and the minimum necessary animal health-related tools to district F/Ps so that they could treat the buffaloes at P/Fs who lived far from Hyderabad. This measure yielded good results. However, such emergent farmer visits and treatments required TA/DA, so there was an issue of non-budget allocation for TA/DA expenses.

8) Genetic Improvement

a) 1st year (2014-2015) milk test data analysis

Dr. Nagamine, a Japanese genetic improvement expert, analyzed the milk test data of 29 buffaloes whose data for the period between one month after delivery and completion of milking were available. The results showed that the normal lactation period of Kundhi buffaloes was nine months. Table 3-8 shows that the sum of average daily milk production for eight months from the 1st to 8th month was 59.03 kg (estimated total milk production during eight months: 1,770 kg). Figure 3-5 shows the milk production or lactation curve peaks after one or two months after delivery.

Table 3-8 Average Daily Milk Production by Number of Months after Delivery (Sum of AM and PM)

Number of months after parturition	1	2	3	4	5	6	7	8	9	10	11	12
Average milk production	9.30	9.53	8.45	7.41	6.80	6.42	5.55	5.57	5.33	4.36	5.69	3.88
Standard deviation	2.50	3.23	3.48	3.79	3.45	2.78	2.44	2.71	2.16	1.86	1.40	2.55
Number of delivery cases	29	29	29	29	29	28	27	25	19	14	7	6

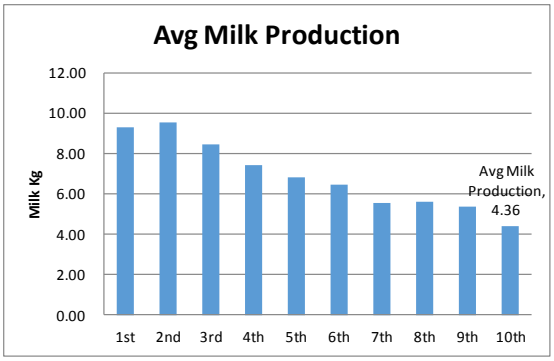


Figure 3-5 Daily Milk Production by Number of Months after Delivery

b) Completion of pedigree registration program software development

The software was completed in November 2015 in the 2nd year after several discussions with a software developer, the Japan Holstein Association. In the 3rd year, the project improved registration procedures so that C/Ps could perform data entry more effectively.

c) Trial issuance of pedigree registration certificates

Initially, the project planned to issue pedigree registration certificates after exchanging opinions with local experts on issues such as evaluating the buffaloes' purity percentage. However, the project decided to issue certificates on a trial basis in the 3rd year. Before issuing the certificates, the project visited all seven breeder farmers and physically confirmed the purity percentage of individual buffaloes and other error data.

Mr. Chiba, a Japanese expert, provides data entry guidance

Mr. Chiba checks an individual buffalo at a breeder farm

d) Result of pedigree registration

In the 3rd year, the project entered the data of 409 buffaloes into the software. Then, the project

deleted the error data, making a total of 387 pedigree registered buffaloes from six breeders. The project printed and issued certificates and distributed the certificates to farmers. A buffalo with certificates would possibly sell at a good price when sold as a bull (added value); the momentum of pedigree registration was thus expected to increase.

e) Milk test

According to the monthly milk test records, a graph of milk production volume during the entire lactation period for each buffalo who had finished its lactation period was drawn. The project calculated the total milk production volume of 65 buffaloes from an approximate curve. Figure 3-6 shows the results for an adult female buffalo at Mr. Basir's farm. The total milk production volume during the 305 days was 1,776 kg. The graph in Figure 3-6 does not peak at a certain point after delivery, but other graphs confirmed that milk production decreases due to shortage of roughage during the winter season and due to stress during hot climate.

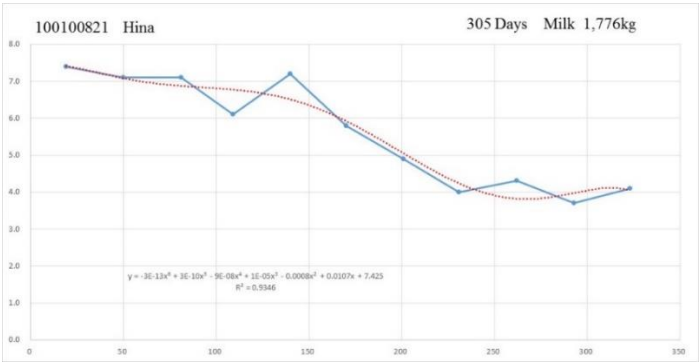


Figure 3-6 Lactation Curve of a Registered Buffalo

Table 3-9 shows the comparison of milk production at six breeder farms. The right most column shows the average length of 2-time (morning and evening) lactation period. Breeder farms that did two times milking showed higher milk production results.

Breeders are usually better off compared to farmers. They tend to prioritize the healthy growth of calves and improvement of milking buffaloes' nutrition conditions over the profit from milk sales, so they often switch from 2-time milking to 1-time milking without hesitation, which makes it difficult to understand the accurate production capacity of a buffalo. However, the breeders showed interest in proving the accurate production capacity of their own buffaloes, after seeing Figure 3-6 and Table 3-9. The breeders thus suggested that they should continue the 2-time milking practice, or that they should measure the entire quantity of milk collected by buckets before giving it to calves.

Table 3-9 Results of Average Milk Production by Breeder Farm

Breeder	Age			Parity No.			Lactation			Milk (kg)			Month of two times milking		
	Ave.		σ	Ave.	±	σ	Ave.	±	σ	Ave.	±	σ	Ave.	±	σ
1	6.5	±	1.4	3.6	±	1.1	277.6	±	24.6	2,491.4	±	430.6	9.6	±	1.1
2	6.4	±	1.6	2.8	±	1.4	281.4	±	24.2	3,437.5	±	484.3	8.7	±	2.3
3	6.4	±	2.2	3.3	±	1.7	297.3	±	15.5	2,807.0	±	820.8	5.8	±	1.7
4	7.4	±	0.8	5.0	±	2.1	302.4	±	5.8	2,180.4	±	252.1	10.2	±	0.8
5	6.5	±	1.2	3.5	±	1.3	290.4	±	27.4	1,576.3	±	344.4	4.0	±	2.4
6	7.2	±	1.9	3.8	±	1.7	292.3	±	23.9	1,604.3	±	245.9	4.1	±	1.8
All buffaloes 65	6.7	±	1.5	3.6	±	1.5	287.0	±	26.1	2,214.3	±	789.6	6.7	±	3.2

f) Milk inspector training

The project provided the 1st milk inspector training session to four inspectors during the process of milk testing at six breeder farms.

(6) Activity (4th year)

1) Trial Feeding of Formula Feed

a) Objective

The objective was to give P/Fs an experience of milk production increase and to let them understand that purchasing formula feed with a guaranteed nutrient value was economically feasible. The project planned to stop providing formula feed for free during the 4th year to determine the percentage of P/Fs who had understood the effectiveness of formula feed and would purchase formula feed at their own expense.

b) Progress and results

Through this trial feeding of formula feed to milking buffaloes, the project provided P/Fs formula feed with a guaranteed nutrient value for up to two buffaloes/farms to verify their milk production and increase from milk sales. The verification period was two years and eight months from February 2015 to September 2017. The results showed a double increase in milk production in buffaloes fed with formula feed.

In September 2017, the project stopped providing formula feed for free and undertook awareness-raising and technical guidance activities so that P/Fs and surrounding farmers would understand the effectiveness of formula feed and purchase the formula feed. After two months, as of November 2017, a total of 24 farmers had purchased formula feed.

c) Designing a formula feed model

The project designed a model of formula feed prepared from concentrate feed that was locally available in Hyderabad. In November 2014, Qadri Fodder Shop started producing the formula feed. In 2016, the Habib Feed Company started producing the formula feed. The total digestible nutrient (TDN) value of the model was 72.2%, dry matter (DM) was 92.6%, and crude protein (on DM basis) was 19.8%.

In mid-2017, the project requested a new formula feed production to Master Agro Industry Limited. The TDN value of the new model was 75%, fat was 3.9%, crude protein (as fed basis) was 16.8%, and crude protein (on a DM basis) was 18.2%. The price/kg was also reasonable, at only Rs.33.25

d) Milk production increase and economic effects

Comparison of whole milk data

The project conducted a trial provision of formula feed to 25 P/Fs for two years and eight months. As shown in Figure 3-7, the average 305-day milk production per head was 2,672 kg for the treatment group (n = 45) and 1,443 kg for the control group[12] (n = 18), whereas the average daily milk production was 8.8 kg and 4.7 kg respectively. The results showed a nearly double increase in milk production.

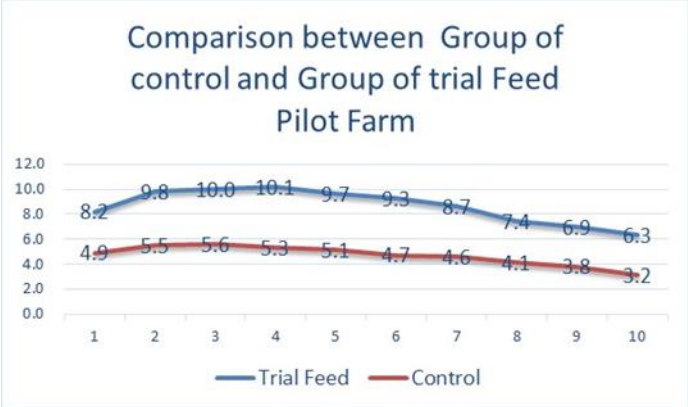


Figure 3-7 Comparison of Milk Production between the Control Group and Treatment Group

Case study of a medium-scale P/F in Matiari District

The average milk production of five buffaloes in the control group was 1,295 kg per lactation period (305 days) and 4.2 kg per day, which showed an average milk production in the rural areas. The same in the treatment group was 2,617 kg for the lactation period and 8.6 kg per day, which showed more than a double increase. The average price of concentrate feed given to the control group was Rs.30.3 per kg, whereas the price of formula feed provided by the project was Rs.33.25 per kg, which showed a difference of only Rs.2.95.

Figure 3-8 shows the average milk production in the control and treatment groups. The intervention group showed a gradual increase in milk production after delivery, drawing an imperfect but moderate curve. On the contrary, milk production in the control group increased slightly after delivery, but only decreased after delivery and did not show any peak.

[12] The control group indicates milking buffaloes that were fed with traditional concentrate feed or without any concentrate feed.

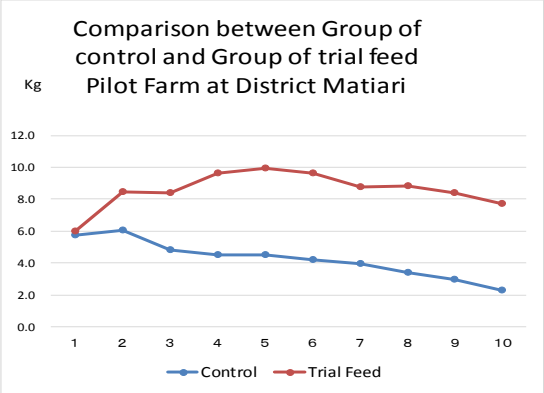


Figure 3-8 Comparison of Average Milk Production between the Control and Treatment Groups

Economic effects

The average milk production of the control group was 1,295 kg, whereas the milk sales price was Rs.70/kg. The gross profit was Rs.90,650, and the concentrate feed price was Rs.34,542, resulting in a net profit of Rs.56,108. In the same way, the net profit of the treatment was Rs.129,717[13], which was more than double that of the control group. The feed effect, which is the milk production volume per kg, was 1.1 kg for concentrate feed and 1.6 kg for formula feed, which showed a 0.5 kg increase in the treatment group.

e) Sales of the formula feed

The project held several discussions with Master Feed so that P/Fs, the surrounding farmers, and breeder farmers would be able to smoothly switch to the purchase of formula feed. Accompanied by C/Ps, a Master Feed sales manager visited the retailer shops and farmers and made some adjustments. In September 2017, the project stopped providing free formula feed. The formula feed purchase results as of October 31, 2017, included four out of 25 P/Fs, 19 surrounding farmers, and one breeder farmer, totaling 24 farmers.

2) Analysis of Daily Gain in Buffalo Calves

The project summarized and analyzed the 12-month growth data of buffalo calves born at P/F farms and those born at the calf salvation center and then distributed to P/Fs. The average daily gain of calves born at P/F farms was 0.33 kg (n=37), whereas that of buffaloes reared at the salvation center was 0.32 kg in the 1st year (n = 39), and 0.33 kg (n = 10) in the 2nd year. The average weight of all calves was 0.33 kg. All these results achieved a target daily gain of the PDM. However, the daily gain of calves between one and two years of age tended to decrease, which implied the necessity of reinforcing technical guidance.

3) P/F Household Income Survey

Weekly interviews with P/Fs had already been completed by the 4th year, but the project had to collect information on how the farmers changed the importance of income from livestock business in their livelihood. Data were also needed for the purpose of TE. In November 2017, the project started a combination survey of simple interviews and monthly measurements using mobile phones. The project selected one ordinary P/F from each pilot district. The target farmers were Mr. Najam-ud-din in Matiari District, Mr. Pehraj in Hyderabad District, Mr. Mushtaque in TA District, Mr. Ramzan in TMK District, and Mr. Qazi in Badin District.

[13] The gross profit was Rs.183,190 (milk production 2,617 kg x Rs.70), and cost of concentrate feed was Rs.53,473. The net profit was therefore Rs.129,717.

4) Simple Milking Shed

The project reviewed the model of a milking shed by considering traditional mooring methods. Figure 3-9 and 3-10 show the new model. In January 2018, the project started to construct milking sheds with this model (using single pipes that were more resilient than wood for poles and roof frames) at three P/Fs in the 1st group that had received milking shed construction materials but were yet to begin construction.

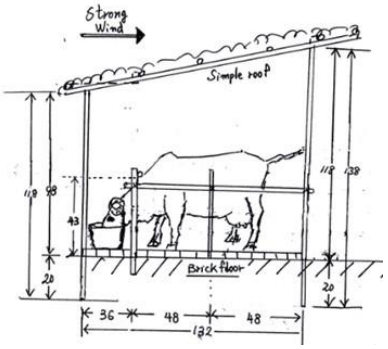


Figure 3-9 Side View

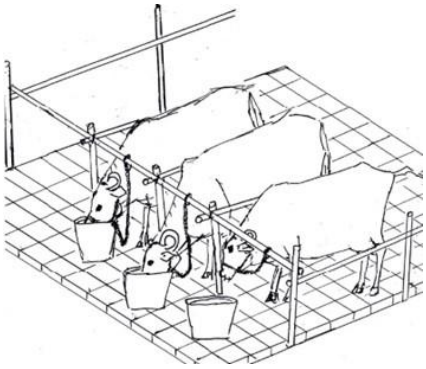


Figure 3-10 Four Buffaloes Can Be Tied

5) Marketing

a) Monthly market information collection

The project continued to collect information from markets near the P/F farms. The collected information was shared with the extension team in a timely manner and with the farmers on marketing training occasions.

b) Marketing model verification

Because the extension activity began at full scale in the 4th year, the project collected successful marketing cases through the extension activity, following the steps below.

- ✓ The marketing C/P joins the marketing training sessions held by the extension team or gets the results of the session from the extension team, and then identifies villages where the new successful marketing cases are likely to be confirmed or villages where a new marketing model can be applied.
- ✓ The C/P visits those villages.
- ✓ The C/P documents a successful case if confirmed
- ✓ In a village where a new marketing model can be applied, the C/P discusses with farmers whether the model can be applied. If agreed, the C/P applies the model and monitors the progress

c) Current situation of the mini laboratory

The main activity at the mini laboratory was milk fat analysis. The project established a structure for milk sample collection, delivery, and analysis, and started milk fat analysis on September 27, 2016. However, due to some troubles, full-scale analysis began on January 31, 2017. In total, 479 samples were analyzed (57 in 2016 and 422 in 2017). All samples were collected from buffaloes. In total, 363 samples were collected from 363 breeder farmers, 24 from P/Fs, 41 from surrounding farmers, 12 from commercial dairy farmers, 22 from milk wholesale markets, and 17 from other places. As Table 3-10 shows, the average milk fat was 5.4%, with a maximum average of 8.3% and a minimum average of 3.2%. The laboratory also

conducted alcohol and milk gravity tests. In this manner, the structure for analysis was established at the laboratory.

Table 3-10 Results of Milk Fat Analysis

	n=	Average	Max.	Min.
Breeder	363	5.9	8.5	3.4
P/Fs	24	5.9	8.8	4.7
Surrounding P/F	41	5.2	10.0	1.9
Commercial Dairy Farmer	12	5.3	8.0	2.8
Wholesale Market	22	5.5	7.8	4.0
Milk Shop	3	5.4	7.2	4.1
Calf Center	14	4.6	7.6	1.6
Average	X	5.4	8.3	3.2
Total	479	X	X	X

6) Development of a Tape Measure for the Body Weight of Kundhi Buffaloes

The project developed a tape measure for female Kundhi buffaloes that could estimate body weight by measuring the heart girth. The project collected data on the body weight and heart girth of about 1,400 Kundhi buffaloes of different ages that were reared by P/Fs and breeder farmers. In 2017, the project analyzed the data of 1,209 female buffaloes and calculated the correlation coefficient of body weight and heart girth, which was 0.9665. The project also analyzed the data from 206 male buffaloes and obtained a correlation coefficient of 0.9556. Figure 3-11 and Figure 3-12 show the regression graphs.

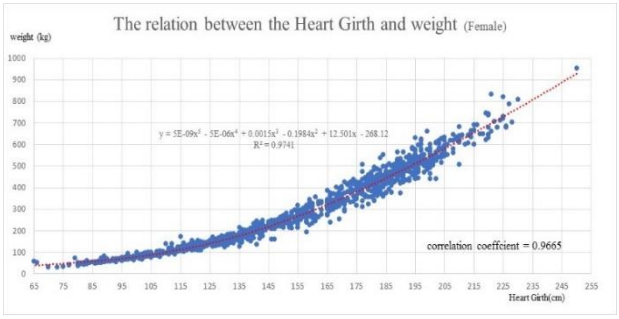


Figure 3-11 Regression Graph of Body Weight and Heart Girth (Female Buffalo)

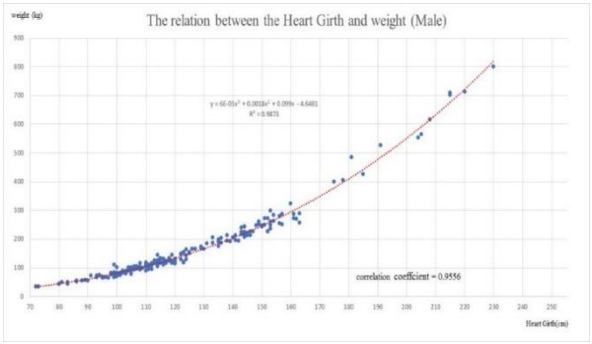


Figure 3-12 Regression Graph of Body Weight and Heart Girth (Male Buffalo)

7) Development of BCS Technologies for Kundhi Buffaloes

a) Objective and background of BCS development

Body conditions indicates "the levels of body fat accumulation." BCS is a numeric score that "quantifies the levels of body fat accumulation" and is easy to judge by visual inspection and palpation. The results are used to determine the quantity of feed and improve other aspects so that animals can fully demonstrate their capacity. BCS is a highly applicable technology that is closely related to reproduction, animal health, and animal genetics.

By effectively applying BCS to milking buffaloes, it is possible to increase and maintain milk production volume. The project developed a BCS judgment technology for local Kundhi buffaloes under the guidance of a Japanese expert who had abundant BCS experience. The project also developed a manual for

this purpose.

b) Newly developed Kundhi buffalo BCS

The evaluation standards of simple BCS are '2.0 for emaciation', '3.0 for normal', and '4.0 for fatty'. The BCS was developed for Kundhi buffaloes but can be applied to zebu cattle and to a crossbreed of zebu cattle and European cattle.

An inspector stands on the left side of the buffalo and judges its BCS. BCS is usually scored every 0.25 points but the project BCS is scored at every 0.5 points as 2.0, 2.5, 3.0, 3.5, and 4.0.

The inspectors palpate only two parts of the buffalo's body, that is, the hip bone and pin bone, to confirm whether there is the presence of subcutaneous fat. Then, the inspector conducts a visual inspection of the ribs on the flanks, the transverse process of the vertebra, sacral ligament, and pin bone ligament. The inspector then checks whether "there is a clear line on the flanks" if there is no subcutaneous fat, whereas the inspector checks whether "there is no clear line on the flanks" if subcutaneous fat is present.

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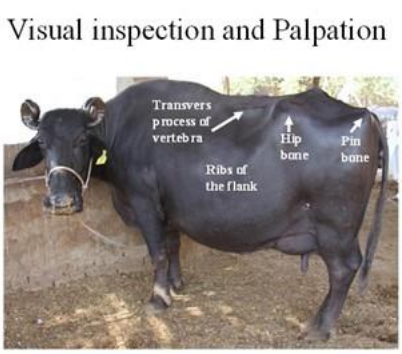
<td> 
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<tr>
<td>A milking buffalo with BCS 3.5 and visual inspection points</td>
<td>A farmer judges the BCS of his buffalo</td>
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8) Hoof-Cutting

The project started a semiannual regular hoof cutting service to a P/F, Mr. Mushtaque in TA District through a local technician, Mr. Premo, and to a P/F, Mr. Ramzan in TMK District through a local technician, Mr. Kano. The project organized the 1st W/S on July 19, 2017. The W/S invited Dr. Abe and three experienced hoof-cutting technicians as instructors and 20 participants that included six beginner technicians and farmers.

		
Demonstration by an instructor	White dead cells on a hoof sole because of improper hoof-cutting	Dr. Abe provides technical guidance on how to cut a sole

9) Technical Training to Livestock Department Officers in Pilot Districts

The project suggested and agreed with the Department key officers in the 2nd Technical Working Group (TWG) meeting that the project would collaborate with the Department officers in pilot districts for providing vaccination and deworming service to P/Fs and the surrounding farmers, and technical guidance, and monitoring at calf distribution beneficiary farmers, all of which had been provided by the C/Ps.

The project divided a 1-week training course into two sessions, conducted the 1st session on animal health for two days in May 2017, and then the 2nd session on calf salvation and appropriate technology in August 2017. The number of participants was 15, including one V/O and two S/As from each of the five districts that were assigned to pilot villages or surrounding villages. After completing the sessions, the project distributed a questionnaire sheet to the participants to determine the level of understanding and the degree of interest in each technical field of the appropriate technologies.

The questionnaire results revealed a significant difference in the level of understanding of appropriate technologies between V/Os and S/As. Based on this finding, the project decided to organize a separate training session for V/Os and S/As when conducting the appropriate technology training for Department officers. Most of the V/Os answered that they were ‘very interested’ in the appropriate technologies, while some S/As answered that they were ‘neither interested nor uninterested’. The results implied that it would be necessary to provide an introductory lecture explaining the appropriate technologies, including the introduction of successful cases, before providing technical guidance to S/As. Similar results were also confirmed for calf salvation.

10) Nutrient Value Analysis of Fodder at PRI

a) Completion of laboratory environment set-up

The high-capacity generator located at the vaccine center next to the PRI laboratory started operating and was connected to the PRI laboratory in June 2017 and then to a cutting mill in November 2017. Therefore, the long-lasting issue of electricity provision to the PRI was fully resolved. Furthermore, three additional air conditioners were newly installed with the JICA budget, so that the analysis work environment was improved.

b) Accurate fodder analysis

The project almost completed providing the main technical guidance for accurate fodder analysis.

The project also developed a fodder analysis manual for C/Ps to smoothly conduct analysis in the absence of a Japanese expert. The total number of samples analyzed at the PRI was 26, as of early December 2017.

11) Training on Reproductive Disorder Diagnosis and Treatment

The project decided to first organize a 10-day beginner training session and then a 5-day refresher training session after six months under the program below.

Beginner training session	Provide technical guidance on the basics of proper methods for reproductive disorder diagnosis in female buffaloes by external examination, vaginal examination, and rectal palpation. Provide guidance on proper recording of rectal palpation sheets so that participants would understand the basics. Distribute certificates to participants after completion of the session.
After beginner training session	After the session, participants were expected to practice gain experiences on proper diagnosis and recording in their own areas.
Refresher training session	Provide guidance on early pregnancy diagnosis and treatment of reproductive disorders.
Permission of treatment	A few months after the refresher session, trainers visited the participants to evaluate the degree of their skills and to judge whether or not these participants could perform proper treatment. Successful participants were allowed to perform treatment.

Following this program, the project organized a refresher training session for the 1st group of participants for five days from July 24, 2017. The main training topic was the diagnosis and treatment of reproductive disorders. The total number of participants was 10, including six experienced veterinarians and four veterinarians who were not experienced enough but had at least a rectal palpation experience. The project developed the 2nd version of the Textbook for Diagnosis and Treatment of Reproductive Disorders before the refresher session.

The project organized a beginner training session for the 2nd group of participants for 10 days from November 15, 2017. The project selected 13 of 18 candidates as training participants. Ten out of 13 were Department officers, and three were private veterinary practitioners. Two were female veterinarians.

Technical guidance on rectal palpation by Dr. Ali

Technical guidance on recording by Dr. Ali

Technical guidance on rectal palpation by Dr. Naeem

12) Reproductive Function Diagnosis of Bulls

Dr. Videz made his 2nd visit and stayed for 39 days from August 27 to October 4, 2017. The project provided technical guidance on the reproductive function diagnosis in bulls to C/Ps and five other veterinarians (four district V/Os and one private veterinary practitioner). After two rounds of guidance, C/Ps were equipped with the skill of proper reproductive function diagnosis in bulls. Moreover, after conducting training sessions, C/Ps also developed their capacity to plan and organize a training session on the reproductive function diagnosis of bulls independently.

During the process of guidance, 47 bulls were diagnosed. The diagnosis results were good for 30 bulls (64%), poor for 13 bulls (for slaughter) (28%), and needed reexamination for four bulls (8%). Poor and reexamination diagnoses accounted for as much as 36% of all cases, implying the need for proper selection and slaughter by variety and species. In particular, the size, asymmetry, and hypoplasia of the testicles are inherited; therefore, it is important to develop appropriate selection criteria and to continue the diagnosis.

13) Reproductive Physiology Research

a) Measurement of IGF-1 values and serum biochemistry

The project collected blood samples from buffaloes reared at the CVDL and P/F farms every month from March 2016 of the 3rd year until March 2017 of the 4th year and preserved the serum samples. In August 2017, the project measured IGF-1 values of 20 samples and analyzed T-chol, BUN, and TP values by biochemical examination.

b) Measurement results and debriefing session

On September 8, the measurement results were shared with C/Ps for exchange of opinions as follows.

The results confirmed a decrease in albumin (Alb) and an increase in BUN during the dry season (April to July) for CVDL buffaloes that were likely to have been under good feeding management at CVDL. These results imply that the quality and quantity of roughage was not sufficient during a certain period of the year. On the contrary, both the IGF-1 value and BCS of buffaloes reared by the P/F were low, implying insufficient provision of both roughage and concentrate feed.

After the measurement, the project decided to conduct a comprehensive analysis of vaginal mucus conductivity value (once a month), rectal palpation records, BCS, milk production, body weight, estrus observation records (occurrence and intensity of estrus), feed ingredients, and provision volume (monthly average) in the future to extract useful information for rural farmers and to compile the results.

14) Technical Guidance on Treatment of Buffaloes

By performing treatment of calves at the center, a Japanese expert trained the C/Ps, and a veterinarian and para-vet of the center based on proper treatment. The veterinarian and para-vet often treated buffaloes at sites, but had rarely used stethoscopes before or cared about hygiene management. The main practical guidance topics were proper diagnosis methods (interview, observation, body temperature measurement, stethoscopes, and percussion), intravenous injection, subcutaneous injection, intramuscular injection, disinfection of tools, and hygienic treatment. The main theoretical guidance topics included proper dosage, use of cortisone and antibiotics, and anti-diarrhea treatment of calves.

		
Dr. Abe provides guidance on proper diagnosis	Stethoscope diagnosis	Guidance on intravenous injection

15) Genetic Improvement

a) Milk inspector training

The milk inspectors' responsibilities included monthly milk tests as well as reporting of transfer, mating, and delivery cases for the purpose of pedigree registration. However, the project decided to add pedigree registration reporting to their responsibilities. The project thus provided a 1-day training session to five inspectors. The results indicated that the inspectors understood more than expected; therefore, the project began pedigree registration reporting by the inspectors. The project planned to examine the accuracy of their reporting, and to issue a certificate of the milk inspector when their reporting levels could reach a certain level.

b) Pedigree registration

When technical guidance was almost completed, there were still some minor mistakes, such as failure of data entry into the pedigree registration software and rectification of abnormal data. The genetic improvement C/P, in collaboration with a national staff member, was able to regularly issue and deliver the pedigree registration certificates.

c) Milk test

The project modified the monthly milk production and milk fat percentage recording format (Excel) so that a tested buffalo's total milk production per lactation period (305 days) was recorded. Simultaneously, the project entered the new recording format 305-day milk production data of 112 buffaloes whose milk testing had been completed before November 2017.

Milk test results

The results of milk testing of 65 buffaloes at six breeder farms were obtained at the average age of 6.7 years. The average delivery was performed 3.6 times, the average milking period was 287 days (maximum 302 days and minimum 278 days), and the average milk production was 2,214.3 kg ± 789.6 kg (maximum 3,437.5 ± 484.3 kg and minimum 1,576.3 ± 344.4 kg). As the farmers regarded the nutrition conditions of mother buffaloes and calves as more important than milk sales profit, the milk production volume per time was large. This made it difficult to judge milking capacity of mother buffaloes from milk production and thus prevented the selection of elite mother buffaloes based on milk production results.

Number of monthly delivery cases

Figure 3-13 shows the number of delivery cases per month. The number started to increase in July, whereas the milk production also started to increase in July and then peaked in October. Table 3-11 shows

the number of milking buffaloes by month and the average milk production. There was a positive correlation with the number of delivery cases; thus, the average milk production peaked in July.

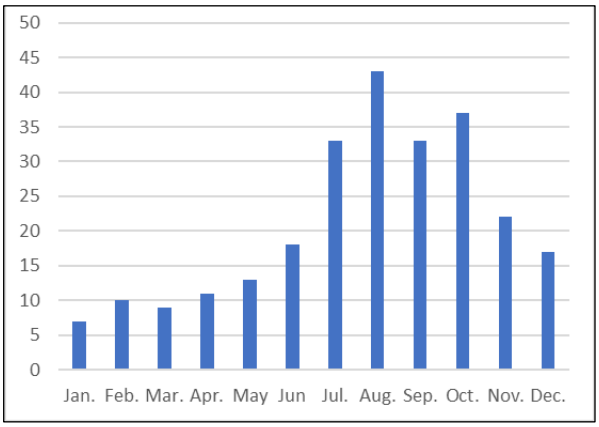


Figure 3-13 Number of Delivery Cases by Month

Table 3-11 Number of Milking Buffaloes and Average Milk Production by Month

month to be delivered	number of heads	number of days	total milk production (kg)
Jan.	1	305	1,819
Feb.	6	293	1,692
Mar.	6	299	1,911
Apr.	5	291	2,003
May	6	283	1,915
Jun	5	305	1,530
Jul.	14	297	2,366
Aug.	15	298	2,254
Sep.	14	288	2,203
Oct.	16	282	2,504
Nov.	14	291	2,219
Dec.	11	294	2,132

d) Calving interval and lactation period

Table 3-12 shows the calving interval and lactation period by farm. The average calving interval was 16.3 months (497 days), which was sound enough and shorter than that at an ordinary rural farm. The average lactation period was 352 days, which was longer than usual. The lactation period of the Kundhi buffalo is generally considered short. However, the results indicated that it could be lengthened with proper feeding management.

Table 3-12 Calving Interval and Lactation Period by Farm

Farm CD	n=	delivery-interval		milking days	dry days
		months	days		
1010001	5	15.3	466	302	164
1010003	4	16.0	486	325	161
1020001	4	15.8	482	359	123
1020002	3	16.5	528	386	142
1030002	4	17.9	544	411	133
Total	20	16.3	497	352	145

Breeder W/S

On December 5, 2017, the project organized a breeder, W/S. Many issues needed to be resolved for building up a sound foundation for animal genetic improvement. For example, there were issues such as difficulties in obtaining good data from milk testing because farmers considered the nutrition conditions of mother buffaloes and calves to be more important than identifying the mother buffaloes' capacity; farmers decreased the frequency of milking from two times to one time per day; and white tail calves were frequently born.

To sustainably continue the genetic improvement activity after project completion, it was considered important for breeders to understand the objective and methods of genetic improvement and to understand the current situation of milk test and pedigree registration under implementation. For this reason, the project organized the 1st W/S. Twelve farmers from six out of seven breeder farms that had been participating in the project activities participated in the W/S. Only two farms were represented by the owners themselves, whereas one was represented by a son, and others were represented by farm manager(s), brother(s), nephew(s), worker(s), and inspector(s). When the project team inquired about the first reason for genetic improvement, five breeders answered "milk production" (83%). The second reason was "Body size of a Kundhi buffalo," but each of them liked different body sizes. Three breeders (50%) answered that they

preferred small size (compact), whereas one breeder preferred a large size (17%), and the remaining two breeders (33%) preferred middle size.

(7) Activity (5th Year – Until January 2019)

1) Technical Training to Department Officers in Pilot Districts (V/O and S/A Training)

Assuming that C/Ps will have to organize the same training session after project completion, the project organized a training session for V/Os from July 30 to August 3, 2018, and another training session for S/As from August 6 to 10, 2018. The total number of participants was 39, including 19 for V/O training and 20 for S/A training. The expenses for the field visit, car rent, lunch, and trainee accommodation were obtained from the PC-I budget. The sessions were conducted with support from the CBU.

None of the trainees had any experience with BCS, heart girth measurement, milk production measurement, or roughage provision volume calculation. All trainees were either veterinarians or para-vets; thus, they were not good at subjects such as farm management, marketing, feeding management, fodder, and genetic improvement. Therefore, the session was designed to include both lectures and practice as well as a field visit. During the field visit, technical guidance was provided on judging the milking capacity of adult milking buffaloes, calculating the feces score, judging the quality of roughage, and calculating the quantity for provision, all of which were technologies that would be practical and useful when teaching farmers. The training content referred to the appropriate technology textbook. .

		
19 trainees at a lecture in V/O training	BCS practice in V/O training	Heart girth measurement practice in S/A Training

Three months after the session, the project provided a questionnaire to the V/Os and S/As. The questionnaire asked whether the trainees used the following 17 technologies during their technical guidance to farmers: 1) farm management; 2) prevention of adulteration of milk; 3) provision of plenty of drinking water; 4) cleaning a water trough; 5) cleaning a feed trough; 6) BCS; 7) feeding colostrum to newly born calves; 8) formula feed for milking buffaloes; 9) quantity of formula feed provision; 10) hay preparation; 11) detection of estrus 12) prioritizing disease prevention; 13) annual calendar for vaccination and deworming; 14) prevention of diarrhea in calves; 15) treatment of diarrhea in calves; 16) proper milking methods; and 17) visual inspection of a high production adult female buffalo. The average rate for the 17 technologies was high at 70%. Only three technologies, BCS, hay preparation, and quantity of formula feed provision, showed percentages less than 50%. The most frequently used technology was “prioritizing disease prevention” (93%), whereas the least used was BCS (21%).

2) Exchange Visit and Exchange of Opinions between P/Fs

The project installed a simple milking shed at the farm of Mr. Niaz, a P/F in TA District. However, he had never used formula feed for milking buffaloes. To encourage him for purchasing formula feed, on July 11, 2018, the project took him to meet another P/F, Mr. Najam-ud-dinn, and his surrounding farmers in Matiari District. Mr. Najam-ud-din had been using formula feed effectively, teaching surrounding farmers, and selling formula feed to 14 of his surrounding farmers.

	
Mr. Najam-d-Din (Right) explains to Mr. Niaz (Left)	The feeding management C/P, Dr. Safdar, makes a supplementary explanation

After the visit, Mr. Niaz realized the effect of formula feed on milking buffaloes. However, as his farm was located far from a retail shop it was difficult for Mr. Niaz to purchase formula feed alone. Therefore, Mr. Niaz decided to conduct a group purchase of formula feed along with his relatives and several other farmers.

This successful case reconfirmed the possibility and effectiveness of the P/F exchange visits as a method of sensitization. It was also helpful in considering the best approach for "(core) farmer to farmer extension," which was one of the Output 3 indicators.

3) Public Relations

In the 5th year, proactive efforts were undertaken for public relations activities. The major activities are described below.

a) Issuing PSLD newsletters

The project issued two PSLD newsletters on the topics 'Let us double milk production by feeding formula feed' and 'Calf salvation.'

b) Leaflets

The project developed a leaflet titled 'Proper application of formula feed for milking animals' in three languages: English, Urdu, and Sindhi. This leaflet and the abovementioned newsletters were distributed to many stakeholders including farmers. Thus, the number of farmers who used Master Feed's formula feed increased to 160 in August 2018.

c) Uploading project textbooks on the Livestock Department website

The project uploaded the Textbook for Appropriate Technology of Dairy Farming for Livestock Technicians and Textbook for Diagnosis and Treatment of Reproductive Disorder of Dairy Cattle and Buffalo on the Livestock Department website[14]in early January 2019.

[14] http://livestock.sindh.gov.pk/sustainable-livestock-development-for-rural-sindh-psld

d) Development of PR videos

The project developed short videos on two topics, formula feed for milking buffaloes and animal reproduction. Japanese experts and C/Ps together shot the footage and performed voice recording for the formula feed videos. The video included an interview with a P/F in Matiari District and a milking scene at his farm. The reproduction video included contents from the reproductive disorder diagnosis and treatment training session. The video reminded the project team of the previous efforts made to obtain the farmers' cooperation. Farmers initially refused ear-tagging and rectal palpation of their buffaloes because of traditional practices in Sindh Province, but they eventually began understanding the results of pregnancy diagnosis and reproductive disorder diagnosis and then became cooperative with the project activities.

Video on formula feed for milking buffaloes

Video on animal reproduction

4) Farm Management

<u>Dairy farming business diagnosis</u>

In August 2018, the project with guidance from a Japanese expert, Mr. Kawamura, calculated the rearing and depreciation costs for buffaloes, and developed rules for diagnosing the appropriate dairy farming business in Sindh Province. The project then completed a dairy farming business diagnosis of four P/Fs in Group 1. Through this process, an Excel file for calculating the production cost, profit, and loss was developed. Calculating the asset values of animals and the depreciation costs was difficult, but Dr. Ikeda developed an Excel system to automatically calculate the asset value necessary for business diagnosis in November 2018.

Technical guidance by Dr. Ikeda

The project developed a manual for the abovementioned analysis system. The farm management C/P entered the data of 11 P/Fs into the system according to the manual, and obtained each farmer's business result tables. The results revealed the following features of the dairy farming business in Sindh Province.

- ＊ Number of milking buffaloes: 2.5 heads (68% of all adult female buffaloes and cows)
- ＊ Percentage of milk sales over milk production: 56% (2,573 kg/4,621 kg)
- ＊ Average total milk production per head: 1,848 kg
- ＊ Average daily milk production per head: 6.0 kg

* Milk production cost: Rs.24.7 ± 9; maximum Rs.37 and minimum. Rs.14
* Average annual sales from products: milk Rs.89,234; male buffalo, fattening buffalo, and adult female buffalo disposal Rs.135,842
* Percentage of sales from live animals and milk: The sales from live animals constituted 60% and exceeded those of milk; thus, livestock assets are more important to small- and medium-scale farmers.

5) Marketing

a) Monthly data collection

The project continued monthly data collection at P/F farms and neighboring retailer shops along with weekly data collection at the milk wholesale market in Hyderabad. The marketing C/P could collect information, conduct simple analysis, and summarize the results by himself. The responsibility of collecting and analyzing the market information belonged to the Directorate of Monitoring and Planning, but few officers were assigned to the Directorate. The Department is expected to continue the same activity after restructuring the Department.

b) Coordination with the extension team

The extension team shared a successful marketing case (Mr. Sultan, a P/F in TA District's case) with the marketing C/P, and the C/P compiled the results. This was one of the project targets, and was therefore achieved.

c) Improving the mini-laboratory environment

The main activity of the mini-laboratory was milk fat analysis. The number of analyzed samples was 1,064. The average percentage of milk fat was 5.72%.

The mini-laboratory technicians could also conduct alcohol and gravity tests smoothly, indicating that the analytical work structure was established.

On January 25, 2019, the project evaluated the milk fat analysis technical skills of Mr. Juneed, a laboratory technician hired under the PC-I budget. The evaluation results showed that he had reached the level of conducting an accurate analysis. The responsibility of mini-laboratory management was transferred from Dr. Soomro, a national project member, to Dr. Iqtadar, the marketing C/P.

6) Feeding Management

a) Simple milking shed

The project installed simple milking sheds made of single iron pipes that had been designed in the 4th year at three P/Fs under the JICA budget. Through the construction process, the project used different roof materials, roof heights, and directions of sheds, and identified an almost perfect milking shed model. The total cost of the materials was Rs.70,000 and only two days were needed for construction.

	
A complete simple milking shed at a P/F, Mr. Niaz's farm	A complete simple milking shed at a P/F, Mr. Ramzan's farm

Installation of simple milking sheds with the PC-I budget

Five P/Fs installed milking sheds with the PC-I budget under the C/P's guidance. Before that, a P/F in Matiari District, Mr. Ghulum, had installed a paddock following the project's guidance, but the floor became muddy and caused problems. Therefore, the project requested a private manufacturer to manufacture a reinforced concrete slab of length of 101 cm, width 51 cm and thickness of 5.1 cm (Rs.350/piece) to be laid on the floor.

	
Partitions and a concrete floor in a milking shed	A reinforced concrete plate with PSLD log

Until then, a P/F in TA District, Mr. Mushtaque, was the only P/F who had been practicing an appropriate model of constructing a wood and bamboo paddock in which buffaloes had free access to water and showed the model to nearby farmers. In the 5th year, the project renovated his paddock using galvanized iron (GI) pipes. If a herd comprises only adult buffaloes, one pipe of 110 cm height is sufficient for renovation. Mushtaque's herd comprised both adult buffaloes and calves; therefore, two pipes were needed.

7) Hoof-Cutting

a) Verification of the effectiveness of regular hoof-cutting practices

The project demonstrated the practices of semi-annual regular hoof-cutting practices at the farms of two P/Fs, Mr. Mushtaque in TA district and Mr. Ramzan in TMK district. Through this process, two local technicians of Mr. Premo in TA district and Mr. Kano in TMK district, improved their hoof-cutting skills and

grew up to be pioneer technicians. The guidance policy is described below.

i) The local method of hoof-cutting while laying buffaloes down is acceptable
ii) Use of a saw and chisel instead of a hatchet is acceptable
iii) The risky method of pulling a sickle toward the technician's body is acceptable (in Japan, a technician pulls a sickle away from his body for safety reasons). However, local technicians must use locally made safety arm guards and locally procured gloves.
iv) Cut a hoof sole and hoof arch properly using the sickle
v) Trim a toe to four-finger width.

b) Hoof-cutting W/S

The project organized the 1st joint hoof-cutting W/S with the Department district office in TA district. Only five local technicians participated in the W/S, at which Mr. Premo, a pioneer technician, demonstrated his techniques, participants showed their hoof-cutting techniques, and exchanged opinions. A presentation on proper hoof-cutting techniques was also made at a primary school in the village. After the W/S, the project team members including the C/Ps discussed the necessary measures for continuing the district-level hoof-cutting W/S more effectively in the future.

8) Tape Measure for Body Weight Estimation

The project developed a body weight estimation table in the 3rd year. For two years, a Pakistani or Japanese manufacturer capable of manufacturing a tape measure to estimate a Kundhi buffalo's body weight based on heart girth[15] was search, but such a manufacturer could not be found. Instead, an economical 10 m glass fiber tape measure was found in Japan, and was used to estimate body weight using both the tape measure and the A5-size table mentioned above.

A body weight estimation table and tape measure

Measuring the heart girth of a calf

9) Fodder

a) Fodder nutrient value analysis at PRI

Fodder analysis guidance to PRI officers targeted six values, DM, CP, crude fat, neutral detergent fiber (NDF), acid detergent fiber (ADF), and crude ash. Dr. Kobayashi made his last visit to Pakistan in July 2021 to complete the analysis of all samples and to finalize a fodder standard table for roughage and grains

b) Fodder sampling

The fodder C/P started collecting and analyzing roughage samples using the *tsubogari* method

[15] A tape measure that can easily estimate body weight from a scale that shows both heart girth (cm) and the corresponding estimated body weight (kg).

(cutting one tsubo, a Japanese area unit equal to 3.306 m^2, of sample and calculating the volume and height), drying the sample, and then sending it to PRI. The structure for a series of sampling was thus established.

	
Measuring the sample height after collection using the *tsubogar*i method	Measuring sample weight

c) Formula feed for milking animals

In September 2017, the project stopped free provision of formula feed. As of December 2017, the number of farmers who had purchased formula feed was 24, whereas, as of late January 2019, it increased to a total of 35, including five of 25 P/Fs, 29 surrounding farmers, and a breeder farmer. After confirming that milk production could increase in an economically viable manner with the provision of formula feed to milking buffaloes, the project reinforced the PR activities and collaborated with Master Feed to conduct awareness-raising activities through formula feed retailor shops.

Public relations

As mentioned above, the project developed a newsletter and leaflet for the formula feed for milking buffaloes in two languages, Sindhi and Urdu, and used the newsletter and leaflet for proactive PR activities.

Collaboration with Master Feed in Karachi

The project regularly discussed with Master Feed in Karachi regarding the formula feed retail price, distance between the P/Fs' farms and retailer shops, and the P/Fs' successful formula feed practices. The project took the retail manager of Master Feed to visit the P/Fs and conducted awareness-raising activities to farmers along with Master Feed. Thus, as of August 2018, the number of farmers who purchased formula feed increased to 160, including four P/Fs, 154 surrounding farmers, and two breeder farms.

P/Fs and surrounding farmers' successful practices

Several retail shops started selling formula feed for milking buffaloes in the village of a P/F, Mr. Ramzan, in TMK District. About 30 farmers, including those living in nearby villages, purchased the formula feed. A P/F, Mr. Najam-ud-Din, in Matiari District, began procuring formula feed and selling it to 14 surrounding farmers. In November 2018, Mr. Najam-ud-Din opened a small shop at his farm and officially started selling formula feed to his neighbors.

10) Animal Reproduction

a) Reproductive disorder diagnosis and treatment

Reproductive disorder diagnosis and treatment are difficult technologies that require extensive experience. In the 5th year, the project provided the 4th and 5th training sessions to the 1st group of trainees

and the 2nd and 3rd sessions to the 2nd group of trainees, that is, two sessions to all. Six of 14 trainees from the 1st group and 6 of 13 trainees from the 2nd group, that is, a total of 12 trainees acquired the skills required. Five of these 12 trainees started providing reproductive treatment services to the farmers for free. The remaining seven trainees nearly reached the qualified level.

After the sessions, under the initiative of the reproduction C/P, trainees from the 1st and 2nd group who showed remarkable improvement in their technical skills were selected as regional leaders. Regional leaders were supposed to provide diagnosis and treatment regularly, together with unskilled technicians. In this manner, all of them were expected to improve their technical skills.

The project developed a plan for animal reproduction training, including three training sessions per year, comprising a 5-day 1st session, 5-day 2nd session, and 2-day 3rd session. Between sessions, regular practical training opportunities were planned for each regional group.

b) Outcome of reproductive diagnosis by rectal palpation

At the beginning of the project, many farmers refused to perform diagnosis by rectal palpation. After providing guidance for long-term and accumulating results, farmers now bring their cows and buffaloes with an expectation of reproductive diagnosis when C/Ps arrive in their villages (example, a case of a P/F in Matiari District, Mr. Najam-ud-din's surrounding farmers).

Many surrounding farmers bring their buffaloes and cows with expectations of pregnancy diagnosis and reproductive disorder diagnosis

11) Reproductive Physiology Research on Kundhi Buffaloes (Conclusion)

a) Summary

The estrus sign of Kundhi buffaloes is so weak that it makes mating difficult. The conception rate of artificial insemination cases is low, but the reason for this is not known. The project assumed that the major reason for the low conception rate was the low hormone secretion capacity due to the smaller size of the uterus and ovaries compared to that of European breeds. The relevant research was then conducted with an objective of identifying the true reasons. This research results revealed that the breeding activities of Kundhi buffaloes were very closely related to their nutritional conditions. The research also revealed that the IGF-1 level in Kundhi buffaloes was very low, that is, lower than that of Japanese wagyu. These results reconfirmed the importance of properly understanding the nutrition conditions of milking buffaloes using BCS to improve the reproduction of Kundhi buffaloes.

b) Outline of reproductive physiology research

Objective of the research

Understand how the nutrition conditions of buffaloes affect their breeding activities

Backgrounds

Buffalo (river buffalo) is the main animal used for dairy farming in the project area. However, its reproductive physiology is yet to be fully elucidated. Therefore, the project conducted a survey to reveal the features of its reproductive physiology, which is key to improve its conception rate.

The reproduction record at P/F farms revealed that most of estrus cases occurred during the rainy season from July until November, and very few occurred in other seasons. Delivery of buffaloes was frequently observed from May to September, which was slightly earlier than the estrus months. These results imply that nutrition conditions and hot weather affect the seasonal reproductive behavior of buffaloes. Therefore, the project planned to confirm this cause-and-effect relationship by measuring the IGF-1 level of Kundhi buffaloes and collecting other types of related data.

Research items and data collection frequency

- ✓ IGF-1 and nutrition condition survey by blood sample testing (once a month): i) IGF-1 (insulin-like growth factor), ii) T-chol, iii) BUN, iv) TP (Alb), and v) globulin (Glb)
- ✓ Inspection of ovaries and uterus by rectal palpation (once a month)
- ✓ BCS (Once a month)
- ✓ Confirmation of estrus signs and their intensity by visual observation (once a month)

IGF-1

IGF-1 is secreted only when animals reach a certain nutrition level of nutrition. As shown in Figure 3-14, the priority of nutritional distribution is maintenance of life, whereas breeding is the least important priority. Therefore, an animal does not go into estrus when it is deficient in nutrition. To reveal the relationship between reproduction and nutrition, the project conducted monthly blood sampling, BCS judgment, rectal palpation, and various data collections.

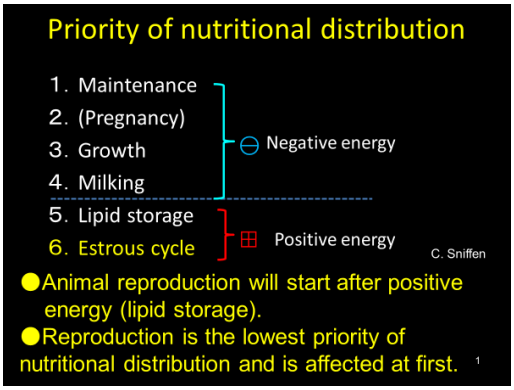


Figure 3-14 Priority of Nutritional Distribution in Animals

c) Research results (Reproductive features of Kundhi buffaloes)

Pregnancy period and signs of estrus

One estrous cycle of a river buffalo is considered to be 21 days on average, whereas one pregnancy period is considered 310 days on average.

Estrus continues for 20 hours and ovulation occurs within 14 hours on average after the estrus signs. It was implied that the main reasons for the longer delivery interval as a result of missing estrus signs was possibly the weak signs of estrus in buffaloes (a small quantity of mucus, no roaring, short estrus hours, rare mounting behavior among female buffaloes) together with the frequently changing volume of roughage provision due to the seasonal conditions in Pakistan, and insufficient concentrate feed provision.

Relation between mating and delivery season and nutrition conditions

As shown in Figure 3-15, the results of the research on estrus and the delivery season of Kundhi buffaloes at P/F farms revealed that more mating cases were confirmed between July and November, whereas only a third of that number was confirmed between January and June. As a buffalo's pregnancy lasts approximately 10 months, many delivery cases were confirmed between May and September, which were 2 months behind, whereas few cases were confirmed between November and April. Improved nutrition conditions due to an increase in roughage provision during the rainy season was considered the reason for increased mating cases after July, whereas decreased cases from January to June were attributed to deteriorated nutrition conditions. These reproduction situations implied the possibility of reducing the extreme difference between high and low mating seasons by providing economical roughage and concentrate feed.

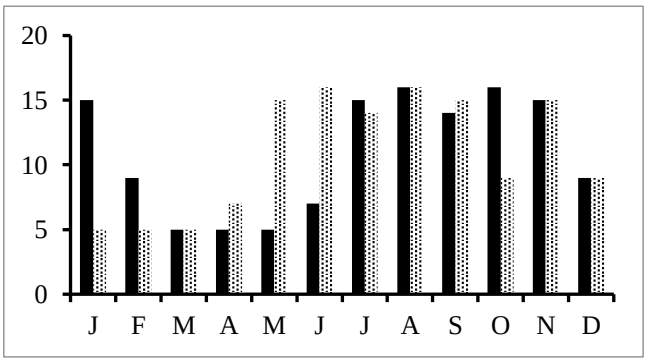


Figure 3-15 Mating Season (Black) and Delivery Season (Gray) of Kundhi Buffaloes

The reproductive physiological characteristics of buffaloes

It is known that a buffalo's energy consumption exceeds energy intake before and after delivery, and thus, the energy balance becomes negative. The more negative the energy balance, the more frequently perinatal diseases such as fatty liver and ketosis occur. Fatty liver decreases IGF-1 production from the liver, and thereby, follicular growth and steroid hormone production are discouraged, which causes reproductive disorders.

According to the results, four buffaloes at the CVDL showed normal IGF-1 values and BCS, so it was considered that their nutritional conditions were satisfactory. However, two buffaloes showed low Alb values during the dry season, which implies that nutritious conditions deteriorate more than expected, even in public organizations. On the contrary, the buffaloes at P/Fs showed comparatively low IGF-1 values and BCS, which indicated an absolute deficiency of roughage provision, and the necessity of improving roughage quality, increasing roughage provision, and providing concentrate feed.

Significance of measurement of IGF-1 (metabolic hormone) levels in buffaloes

Usually, improved dairy cattle with high yield capacity show significantly decreased body weight

within one month after delivery because they drastically increase milk production after delivery and easily makes its energy balance very negative. Supplementation of deficient energy with body fat mobilized by growth hormone is needed because they cannot take as much feed as they need for milk production over a certain period. Growth hormones usually promote IGF-1 secretion from the liver and metabolism (or cell division) within internal organs. However, when cattle develop moderate or severe fatty liver disease, IGF-1 production is inhibited.

Liver-derived IGF-1 is indispensable for maintaining normal ovarian function, but when the energy balance of cattle becomes negative, it indirectly suppresses ovarian function and frequently results in ovarian quiescence and follicular cyst disease.

This relationship between nutrition (metabolic hormone) and reproductive function has never been scientifically revealed until recently. The results are now being applied for the nutritional management of perinatal dairy cattle belonging to dairy farmers.

Our research revealed that the conception rate was high between September and November, whereas it was low during the dry season. The same tendency was not observed for dairy cattle and beef cattle reared in a stable environment throughout the year. Therefore, conducting a whole-year study on feed provision and the biochemical nutrition index of Kundhi buffalo is indispensable for improving their reproductive ability.

There were no CVDL buffaloes whose IGF-1 values had decreased or whose BCS had become lower than 2.5. However, most buffaloes showed decreased Alb values for two to four months during the dry season, which confirmed the necessity of improving fodder provision during this season. On the contrary, P/F buffaloes showed low IGF-1 values and BCS values lower than 2.5, which confirmed the necessity of improving fodder provision throughout the year.

12) Animal Health

a) Treatment of diarrhea in calves

In the 2nd year, the project developed a draft list of appropriate treatments for different diarrhea scores. In the 5th year, the project finalized the list based on the experiences accumulated at the center and at P/F farms. As shown in Figure 3-16, the list suggests the best treatment for the three different fecal scores. A score of 2 and below recommends special treatment including intravenous injection by a veterinarian.

			Treatment by farmer	Treatment by veterinarian
Score 3 	**Light diarrhea** Stool is too soft to form its shape. When animals defecate, stool splashes.	Calf is standing. Calf drinks milk but slowly or does not drink.	ORS Medicine for stomach and intestinal disorder: 2 times	×
		Calf doesn't stand up. Calf doesn't drink milk.	ORS Antidiarrheal (Scorex oral suspension) : 2 times a day	
Score 2 	**The terrible diarrhea** Very loose, soup form of dung.	Calf is standing. Calf drinks milk but slowly or does not drink.		It is better intravenous injection 2 liter of physiological saline solution containing sulfa drug by veterinarian
		Calf doesn't stand up. Calf doesn't drink milk.	ORS Injection Sulfa drug by intramuscular injection	
Score 1 	**Bloody stool** Sometimes blood is mixed with stool	Calf is standing. Calf drinks milk but slowly or does not drink.		It is better intravenous injection 2 liter of physiological saline solution containing sulfa drug by veterinarian + Anti-coccidium
		Calf doesn't stand up. Calf doesn't drink milk.		

Figure 3-16 Types of Treatment Based on Feces Score

b) Annual calendar for vaccination and deworming

In the 2nd year, the project developed a preventive health calendar. In the 5th year, the project finalized this calendar based on the experiences accumulated at the center and P/F farms.

Theoretically, is better to vaccinate calves older than three months because they have the capacity to produce antibodies. However, after studying various cases, some cases of buffalo vaccination at less than three months of age were found in highly infected areas, if they belonged to species with high mortality rates. Therefore, the project decided to vaccinate 6-week old calves with the first dose for HS, which is the most feared disease in Sindh Province, followed by the second dose at six months of age, that is, two times per year.

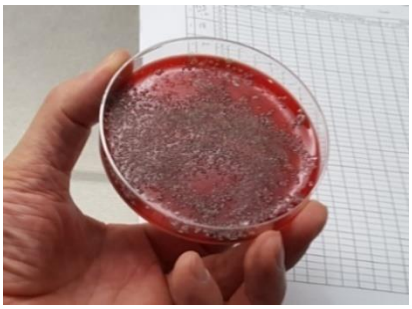
c) Milk hygiene

Dr. Kanameda's technical guidance period was only five days in August 2018. However, during this short period, Dr. Kanameda was able to the observe milking hygiene procedures of small-scale P/Fs, to measure the hygiene levels from bacteriological and visual aspects, and to provide recommendations for improving the used methods.

Cultivation samples were collected from i) five milk shops, ii) milk from 15 buffaloes and milk collected in a milking bucket at Mr. Amir's farm in the old cattle colony, iii) milk, normal water, rinse water with disinfectant, and a milking worker's finger at a P/F, Mr. Niaz's farm, iv) milk from four buffaloes, and a milking worker's finger at the CVDL. All the samples were cultivated at CVDL.

A series of studies revealed the future challenges of: i) providing hygienic milk to consumers; ii) issuing visual certificates on the degree of bacterial contamination during normal milking procedures; iii) encouraging the use of disinfectants as a preventive measure against subclinical mastitis; iv) strengthening technical guidance on the use of teat dip cups and iodine solution, and v) collaboration between producers and diagnostic laboratories. The project summarized these challenges into the following two points and explained them to the Livestock Department:

i) Include bacteriologic examination at CVDL as a countermeasure for mastitis and milking hygiene improvement activities. Visually share progress among stakeholders by collaborating with the PSLD.
ii) Use sodium hypochlorite at 200 ppm concentration as a disinfectant.

		
Examining the levels of contamination on a milking worker's fingers	A bacterial colony after cultivation	Explaining the cultivation results to farmers

13) Genetic Improvement (Conclusion)

For genetic improvement of Kundhi buffaloes, the project encouraged farmers and technicians to use "the proper methods of collecting the basic data required for genetic improvement" in order to build up a basic foundation for genetic improvement. On January 29, 2019, the Kundhi Buffalo Breeding Association was officially established, which marked the start of a long genetic improvement journey. However, the association is still fragile and thus requires continuous technical support from the C/P. The major 5th year activities for establishing this association are described below.

a) Milk production record

A final format for the breeder milking record file (BMRF) was developed. As a result of collaborative efforts by the genetic improvement C/P, Dr. Jatoi, and a national staff member, Ms. Zahida, a structure for a series of activities including milk test data collection and entry, and filing record sheets was established. The BMRF summarizes all the monthly milk test data collected from the beginning of the milk test activity by farmers and from tested buffaloes. The BMRF also summarizes the data on total milk production and average milk production on a specific test day by farmers, and can be used as a list of all the farmers' data.

b) Development of a format for calculating milk production and providing feedback to breeders

The project developed a format that calculates total milk production, total milk fat, and milk fat percentage by entering the 305-day data of a Kundhi buffalo or the one-lactation period data of a dry adult female buffalo collected through monthly tests. Simply by entering milk production, the format will generate a graph for one lactation period.

c) Pedigree registration

The project established a system for the C/P to conduct initial registration, ear-tagging, and purity percentage judgment of Kundhi buffaloes. The structure for recording monthly mating, conception, delivery, and transfer (sales and death) data and for managing the registered data was also established. Ms. Zahida, a national project member, and Dr. Jatoi can now collaboratively perform the tasks of entering all pedigree data into the software developed by the Japan Holstein Cattle Association, and issuing pedigree registration

certificates as needed.

d) W/S

In general, developing countries, including Pakistan, prioritize preservation of the pedigree of pure breed and do not have a capacity improvement target that caters to the needs of farmers. The same applies to the Kundhi buffalo in Sindh Province. A majority of stakeholders such as breeders, experts, and farmers prioritize the appearance and body shape of buffaloes, that is, a small and jet black body, winding horns, and a face of moderate length and width, while not considering milk production and reproductive capacities as important. Therefore, in the 4th year the project started organizing a W/S for encouraging breeders to prioritize genetic improvement targets.

In the 5th year, the project organized the 2nd W/S in July 2018 at Mr. Bashir's farm in TMK District and the 3rd W/S in December 2018 at Mr. Gujar's farm in Badin District. The participants were shown the animals being reared by the abovementioned P/Fs, exchange of opinions was facilitated among the participants to raise their awareness of genetic improvement. In the 3rd W/S, the project shared a future plan for the next 1.5 year with the participants, looking ahead to the future after project completion.

e) Priority genetic improvement targets in Kundhi buffaloes

After several W/Ss, breeders who had participated in the milk testing started to change their attitudes. In a W/S in the 5th year, the project interviewed the breeders on their priority targets or selecting good Kundhi buffaloes.

The most frequently answered priority target was milk production (five breeders among seven [71%]), whereas only two breeders answered "body shape" or "health conditions of calves" (one breeder for each). The second priority target for most breeders was body shape. The breakdown of answers on preferred body size was four for small size (57%), two for moderate size (29%), and one for large size.

f) Breeder meeting

1st breeder meeting

The 1st breeder meeting was held on December 28, 2018, in which a draft overall future activity plan was agreed upon. The monthly milk testing fee was set at Rs. 1,500. Mr. Ali Hyder Shah and Mr. Basir Almani were assigned as coordinators of the association.

2nd breeder meeting

The 2nd breeder meeting was held on January 29, 2019, with the initiative of Mr. Ali Hyder Shah. Six of nine foundation breeder farmers (67%) attended the meeting. The meeting approved the establishment of the Kundhi Buffalo Breeder Association and assigned Mr. Ali Hyder Shah as the 1st president. The meeting also approved a temporal admission fee of Rs. 3,000 and an annual membership fee of Rs.2,000.

Ms. Zahida, a national project member, was hired by the association for a period of five months. Ms. Zahida worked only three days per week but performed many activities, such as technical transfer to a computer operator, accounting, and development of an association leaflet.

	
Breeders meeting	Mr. Ali Hyder Shah, the 1st President

g) Draft articles of the Kundhi Buffalo Breeder Association, draft rules, and regulations for Kundhi buffalo registration

The project developed a final draft of the articles and regulations for the association. These articles and regulations were developed by revising the original Japanese version according to local needs.

(8) Activity (5th Year – After February 2019)

1) Activity Policy and Overview

As mentioned in Chapter 2, from February 2019, the Japanese experts decreased the frequency and number of days of visit to Pakistan and performed only advisory responsibilities so that the Department would continue implementing the project activities sustainably after project completion. However, the C/Ps were forced to work in a bad environment after February 2019 because of frequent power outages, unavailability of generators, lack of internet access, unavailability of project vehicles, and fuel deficiency, most of which were due to delayed budget disbursement.

Under such an environment, the project encouraged C/Ps to keep their motivation and hope for future activities by aiming to achieve the following three targets of the newly developed 3-year action plan.

i) To increase the capacity of 15 V/Os and 75 S/As on appropriate technologies in five pilot districts.
ii) To increase the capacity of 45 veterinarians on reproductive disorder diagnosis and treatment of cattle and buffaloes.
iii) To strengthen the capacity of the Kundhi Buffalo Breeders Association for animal genetic improvement.

Activities and events that helped C/Ps keep their motivation

The C/Ps received high praise from the Department and external stakeholders through the following activities and events, which helped them maintain their motivation.

- ✓ Khyber Pakhtunkhwa (KP) Province Livestock Mission visited the project and exchanged opinions with the C/Ps. (April 1-2, 2019)
- ✓ Mr. Takashima, Deputy Resident Representative of JICA Pakistan Office, visited the project and exchanged opinions with C/Ps (April 22, 2019).
- ✓ Developing the 3-year action plan (April-October 2019)
- ✓ The Consulate General of Japan in Karachi organized a press tour (November 11, 2019, for rehearsal and December 10, 2019, for the tour).
- ✓ Ms. Ujiie and Mr. Amir Bukhari, JICA Pakistan Office, visited the project and exchanged opinions with the C/Ps (November 13-14, 2019)

- ✓ A private constructor installed simple milling sheds using the PC-I budget (2019).
- ✓ A monitoring and evaluation study on calf salvation plans was conducted with the JICA Pakistan Office budget. As a result, a new proposal was prepared (November 2019-January 2020).
- ✓ The C/Ps supported organizing the Livestock EXPO 2020 and opened the project booth (February 8–9, 2020)
- ✓ Printing additional copies of the Textbook for Appropriate Technology using the JICA Pakistan Office budget (50 English and 580 Sindhi copies) (May 2019)
- ✓ Developing project posters that included illustrations of farmers using the JICA Pakistan Office budget (two Sindhi posters) (March-May 2019)

2) Sindhi Translation of the Textbook for Appropriate Technology

Appropriate technology training to Department officers in pilot districts is one of the main activities of the 3-year action plan. In February 2020, all C/Ps started the translation work to develop a Sindhi version of the Textbook for Appropriate Technology. The JICA Pakistan Office budget was used for this work. Although the number of COVID-19 cases started to increase in March, and the government took lockdown measures on March 19, the translation work was continued and was completed in April. In total, 580 copies were printed in May.

3) Development of Feed Standard Table for Sindh Province

The feed standard table provides the basic data for feed quantity calculation. The project developed an original feed standard table for Sindh Province (roughage and formula feed) using the PRI feed analysis data. The table was completed in March 2020.

4) Animal Reproduction

a) Reproduction training

Table 3-13 shows a list of reproduction training courses conducted with the PC-I budget. The C/Ps can now carry out all the related works such as selection of candidate trainees, preparation and implementation of courses, and technical follow-up after the course with their own initiative.

Table 3-13 List of Reproduction Training Courses

Group	Course Title	Period	No. of Participants
3rd Group	Male buffalo functional test and female buffalo reproductive disorder	February 4-8, 2019	10
4th Group	Male buffalo functional test and female buffalo reproductive disorder	February 11-15, 2019	10
5th Group	Male buffalo functional test and female buffalo reproductive disorder	March 4-8, 2020	11
6th Group	Female buffalo reproductive disorder	April 22-26, 2020	10

b) Reproduction data analysis

Dr. Ali, the reproduction C/P, sent the data on body weight, monthly age, BCS on the first estrus, and first delivery days of 282 buffaloes to the Japanese Expert. The expert analyzed the correlation between body weight and estrus in five groups with different body weights. However, the difference was not

statistically significant.

5) Genetic Improvement of Kundhi Buffaloes

a) Strengthening Kundhi Buffalo Association

In January 2019, the Kundhi Buffalo Breeder Association was founded. In March, the association established a temporary office within a project office in the genetic improvement C/Ps room. The association and C/P developed a leaflet with an association logo.

The project had been paying milk testing fees to milk inspectors during the project period. In March 2019, the system of breeders paying their own testing fees was started in the Matiari District. Thus, milk testing by breeders for breeders was finally started.

The final version of the association logo

b) Genetic improvement mission dispatch plan

In late January 2019, as requested by the JICA Pakistan Office, the Japanese expert started to consider a genetic improvement mission dispatch plan. Considering the association's still fragile management capacity, the Japanese expert suggested dispatching a genetic improvement mission to develop a future plan. On February 18, the C/P and the president of the association agreed on the TOR, and then shared the results with the P/M and D/G. On March 9, the project explained the TOR to the Secretary Livestock and reached a consensus on the dispatch of the mission.

c) Purchase and transportation of male adult Kundhi buffaloes for future semen production

The project purchased a male Kundhi buffalo (ear tag no.1274) from Mr. Basir's farm with the PC-I budget for producing frozen semen from Kundhi buffaloes in the future. On November 23, 2019, the purchased buffalo was transported to the SPU in Karachi.

6) Transfer of C/Ps

As Table 3-14 shows, four of eight technical C/Ps were transferred to other posts. However, as opposed to initial expectations, the transfer of C/Ps produced positive results on the promotion of project activities. The transferred C/Ps were provided with vehicles and necessary budgets at their new workplace. They have been using these resources effectively to fully demonstrate their project experience. The Department key officers including the Secretary Livestock, highly appreciated their proactive efforts, and thus took tolerant attitudes toward the C/Ps continuing the project activities on a part-time basis.

Table 3-14 Transfer Dates and New Posts of Four C/Ps

Month	Dr. Jatoi	Dr. Ali Shahani	Dr. Naeem	Dr. Iqtadar
September 2019	Deputy Director Matiari	Deputy Director Tharparkar	Deputy Director Hyderabad	
	↓	↓	↓	
November 2019		Senior V/O Badin		
		↓		
July 2020	Director Research and Extension	Additional Director TMK	Additional Director Matiari	Deputy Director CVDL

Dr. Ali's case

Dr. Ali Shahani, who was assigned as the Additional Director, TMK District, visited three villages in August 2020 to demonstrate a pregnancy diagnosis by rectal palpation, vaccination, and deworming of buffaloes by himself together with his staff members. Usually, as an administrative officer, an additional director does not demonstrate technical service or provide technical guidance in the field.

Dr. Naeem's case

Like Dr. Ali, Dr. Naeem, who was assigned as the Additional Director, Matiari District, also visited villages with extension workers and District office members to demonstrate heart girth measurement, vaccination, and deworming of calves distributed under the calf salvation plan.

	
Dr. Ali, Additional Director, conducts a pregnancy diagnosis by himself	The Additional Director himself demonstrates heart girth measurement

Dr. Jatoi's case

On September 21, 2020, a W/S on "genetic improvement of Sindhi indigenous livestock animals" was held at the Matiari District Office under a joint sponsorship of the Directorate of Research and Extension and Matiari District Office of the Department. The W/S objective was to introduce i) pure blood preservation of indigenous species and future genetic improvement, ii) milk production testing and pedigree registration, both of which are basic animal improvement technologies, and iii) appropriate technologies developed by the project. In total, 90 persons including 21 breeders, 45 farmers, two P/Fs, five NGO members, and one senior veterinarian participated in the W/S.

	
W/S participants	Dr. Jatoi's speech on animal improvement

7) COVID-19 Impact Survey (Technical Aspects)

With the help of C/Ps, the project collected information on livestock farmers and markets under the lockdown measures. The survey reconfirmed that people continued to sell and buy livestock products at the minimum level because livestock products were essential for life and livestock continued to be an important asset to poor farmers. The survey results and suggestions are presented in Chapter 5.

8) Development of Illustration Posters for Farmers

The project decided to develop illustration posters with the JICA Pakistan Office budget for disseminating appropriate technologies to many farmers effectively and for technical district officers' technical guidance to calf salvation beneficiary farmers.

On February 15, 2019, the project held the 1st meeting with two illustrators and decided the titles of the posters as "Let's maintain good nutrition conditions" and "Let's use proper milking practice". Regardless of lockdown measures, the C/Ps and the illustrators continued to communicate via email and WhatsApp, and finally completed 18 posters (draft) in Sindhi. Each of the two types of posters comprised eight illustrations, one of which for each is shown below

	
Title: Let's use proper milking practice	Title: Let's maintain good nutrition conditions

The plan was to finalize the posters during the Japanese expert's last trip on June 2021. However, the trip was canceled due to the COVID-19 situation. Taking the opportunity to visit Sindh Province on another mission in October 2021, the posters will be finalized.

3.4.2 Products

Table 3-15 lists the technical cooperation products for Output 1.

Table 3-15 List of the Technical Products of the Project[16]

Type	Title	Submission Year	Contents	Appendix No.
Appropriate Technology Guideline	Textbook for Appropriate Technology of Dairy Farming for Livestock Technician (May 2020) (English Version)	5th year	A textbook summarizing the livestock-appropriate technologies selected after verification at P/F farms.	T1-1
	Textbook for Appropriate Technology of Dairy Farming	5th year	Sindhi translated version of the above textbook.	T1-2

[16] The SOP for Output 1 activities is included in Table 3-58.

Type	Title	Submission Year	Contents	Appendix No.
	for Livestock Technician (April 2020) (Sindhi Version)			
	Text for Financial Analysis for Farm Management	3rd year	A textbook that summarizes the methods of dairy business analysis from the P/Fs' experiences.	T1-3
	Textbook for Marketing	4th year	A textbook that summarizes milk distribution channels at project sites and the successful cases of P/Fs and surrounding farmers.	T1-4
	Textbook for Feeding Management and Fodder	4th year	A textbook for technicians that summarizes the basics of feed for livestock animals, including roughage and concentrate feed.	T1-5
	Textbook for Nutritional Evaluation of Feed Stuffs for Poultry and Ruminant	4th year	A textbook for technicians summarizing the methods of livestock animal feed analysis.	T1-6
	Textbook for Diagnosis and Treatment of Reproductive Disorder of Dairy Cattle and Buffalo	4th year	A textbook that summarizes the basic knowledge of reproductive disorders in male and female buffaloes, and the basics of diagnosis and treatment	T1-7
	Handbook for Pedigree Registration of Kundhi Buffalo	3rd year	An instruction guideline for pedigree registration prepared for milk inspectors.	T1-8
	Textbook for Genetic Improvement of Kundhi Buffalo	4th year	A textbook for technicians that summarizes the basics of genetic improvement in Kundhi buffaloes.	T1-9
	Poster	4th year	BCS	T1-10
	Poster	4th year	Weighing scale	T1-11
	Poster	4th year	Body weight estimation chart	T1-12
	Poster	4th year	Retainer	T1-13
	Feed Standard Table	5th year	A table summarizing the fodder ingredients commonly used in Sindh Province	T1-14

Table 3-16 lists other products for Output 1.

Table 3-16 List of the Other Products of the Project

Title	Submission Year	Contents	Appendix No.
Manual for Hoof-Cutting Workshop	3rd year	A simple textbook used in the hoof-cutting W/S.	Z1-1
Delivery Estimate Scale	3rd year	An estimate scale predicting the expected delivery date by pointing the arrow to the direction of the mating date. Easily used by technicians and farmers.	Z1-2

Title	Submission Year	Contents	Appendix No.
Manual of Milk Fat Analysis Gerber Method	4th year	A textbook for laboratory technicians that summarizes the Gerber methods of milk fat analysis.	Z1-3
Dairy Farm Record Calendar 2018	4th year	An annual calendar on which farmers can record reproduction, animal health, and farm management data.	Z1-4

3.4.3 Levels of Achievement of Indicators

Provided below is a summary of PDM Ver. 4 Output 1 indicators and Table 3-17 summarizes the levels of achievement as of June 30, 2021.

Narrative Summary	Objectively Verifiable Indicators
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms.	1-1. Effectiveness of appropriate technologies is verified at 25 pilot farms with the following indicators: 1) Average milk yield of cattle/buffaloes increases by more than 25 % compared with the current average of farmers in general (4 liters/day) 2) Average daily gain of cattle/buffaloes increases by more than 10 % compared with the current average of farmers in general (250 g/day) 1-2. The counterparts have the capacity to instruct extension workers and incumbent officers on the contents of the technology guidelines prepared by the Project.

Table 3-17 Levels of Achievement

Indicator No.	Levels of Achievement
1-1	This indicator was achieved in the 4th year as described below.
1)	As a result of a trial, average daily gain of calves with formula feed provision reached 8.8 kg, which was almost double that of calves without formula feed provision. The TE Mission confirmed the achievement of this indicator, although under a specific condition of formula feed provision.
2)	According to the growth data of calves of up to 12 months old, the average daily gain of calves during the first 12 months was 0.33 kg for calves at P/Fs, 0.32 kg for 37 calves at the calf center (1st year and 0.33 kg for 39 calves at the center (2nd year), all of which exceeded the PDM indicator target of 0.275 kg.
1-2	As a result of guidance from the Japanese livestock experts and a third-country expert (Dr. Videz), cooperation from national staff members, and devotion of all the C/P to the project activities, the indicators had been achieved by February 2019. The C/Ps already started providing technical training courses to other Department V/Os and S/As.

3.4.4 Project Sustainability after Project Completion

After the project extension in February 2019, the activities of the C/Ps were greatly affected by shortages in the project budget. Several C/Ps were transferred to Matiari District and TMK District after July 2020, but they continue to exercise their project experiences and technologies at new their workplaces and have shown remarkable results. For example, they organized a field-day event in which they bring district

officers to villages for vaccination and deworming; they provide technical guidance on appropriate technologies and calf salvation together with other C/Ps; they organized an appropriate technology W/S to district officers with the help of other C/Ps; and Dr. Jatoi, who was assigned as the Director of Livestock Research and Extension, organized genetic improvement W/Ss in Matiari, Badin, and Larkana District.

It is best if the Sindh Government approves the 3-year action plan budget and the Department implements the action plan after project completion, but even with a limited budgetary recourse, the C/Ps are expected to exercise their project experiences under the given conditions, and to continue their efforts for acquiring the budget patiently.

3.5 Output 2: Activities, Products, and Levels of Achievement

3.5.1 Activities

(1) Calf Salvation

The project involved establishment of a calf experimental farm in the 1st year. The farm was located in the courtyard of the Livestock Department building. All the facilities were completed in November 2014, three months later than the original schedule, and the first calf was welcomed in late November. The farm was named the 'calf salvation center' (hereinafter referred to as the center). The center continued its operation until September 2017, when it had to be moved because of public road expansion.

1) Preparation of the Center Environment

a) Quarantine system

To protect buffalo calves from infectious diseases, wire net fences were installed surrounding the center, to prohibit the entry of outsiders. Disinfection boxes were prepared at the entrance gate to disinfect the shoes of those who entered the center.

The wire net fence

Disinfection box at the entrance

Additional wire net fences were installed to complete the quarantine system. As the eastern side of the center was separated from roads by block walls, fences were installed on the remaining three sides of the center. The height of the fences was 1.5 m and their length was 67 m, with 1.5-inch pipes used for 24 posts, and 1-inch iron pipes used for the side bars. The entrance gates were made of hinged double doors.

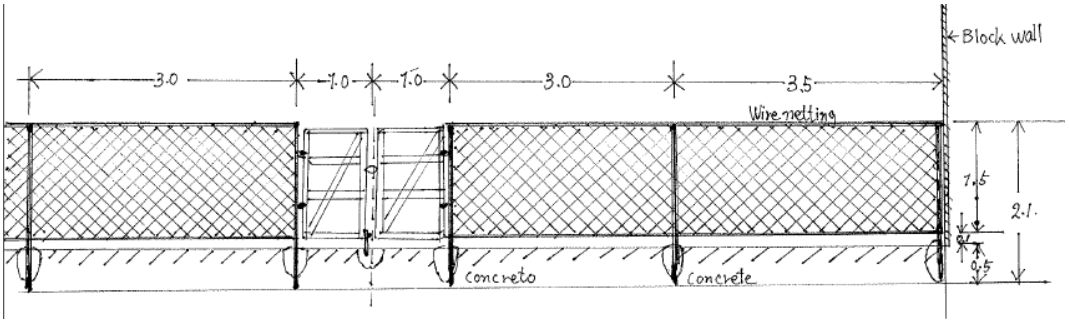


Figure 3-17 Model of the Wire Net Fence and Entrance Gate (Drawn by Dr. Tominaga)

b) Installation of a tent warehouse

The project was established at the center of a multipurpose tent warehouse that could store the equipment and fodder necessary for calf rearing. The warehouse was also equipped with desks and simple beds so that workers could work in the warehouse and sleep on emergency occasions such as when calves get sick. The warehouse was constructed such that it could be easily removed upon project completion. The warehouse was made of iron pipes and was covered with a tent-cloth. The warehouse was originally established for a 2-year operation, but in the 3rd year it was repaired with a new tent cloth to cover the roof because its operation period was extended with the revised PC-I budget.

	
Tent warehouse (1st year)	Tent warehouse roof repaired with a new sheet (3rd year)

c) Calf hatch

The project decided to construct calf hatches from wood because of the five advantages of low price, high effectiveness, high efficiency, hygienic conditions, and resilience. The project developed and installed 10 hatches to rear suckling calves, measure daily calf starter intake, and strictly manage the health management of calves. The hatches were placed in a line and shifted to clean places every day.

In the 2nd year, the roof was repaired using plywood boards and a sunshade made of cloth was placed because of the continuous extremely high temperature.

		
First model of calf hatches (1st year)	Improved calf hatches (2nd year)	Hatches with cloth sunshade (2nd year)

d) Group feeding-purpose paddock and facility for body weight measurement

The paddock was made of locally available logs and bamboo. The calves were reared in groups in this paddock after weaning.

Group feeding paddock and body weight measurement facility

2) Calf Introduction and Rearing Management Structure

Calves were introduced in the project by former cattle colony farmers. The project provided colostrum to calves, disinfected their umbilical cords, and injected long-action antibiotics immediately after birth. Plastic sheets were placed at the delivery places to avoid contamination of calves with the unhygienic floors of farmers. Immediately after arriving at the center, the calves were marked with ear tags, weighed, entered into calf hatches, and fed the remaining portion of colostrum from the cattle colonies.

The project hired two workers and one para-vet to operate the center, and provided technical guidance on calf rearing, hygiene management, measurement of daily calf starter intake, and prevention of disease.

(2) Calf Salvation (2nd Year)

1) Setting a Daily Gain Target

The average daily gain of buffalo calves in rural Sindh was approximately 250 g. The project aimed to achieve 500 g of daily gain at the center. To achieve this target, the project developed a calf starter and

formula feed for growing calves based on concentrate feed ingredients locally available throughout the year. Thanks to a series of technical guidance points including infectious disease prevention and individual animal management through application of calf hatches, free access to drinking water during and after the lactation period, and continuous supply of hay, the daily gain during the lactation period was 430 g, which almost achieved the target.

2) Calf Rearing Plan

The original plan was to rear claves individually for 45 days of the lactation period and in a group for another 45 days after the lactation period, i.e., for 90 days in total. However, the project extended the lactation period to 60 days, whereas the group feeding period was shortened to 30 days, considering the results of daily gain of calves and the quantity of calf starter intake. As the lactation period was extended by 15 days and the center had to use 10 calf hatches for a longer period, and the number of calves that could be reared at the center decreased from 80 to 60 heads per year. The results indicated that only 49 heads were reared at the center because the project had not been able to bring one calf after another smoothly and the calf hatches remained vacant for more days.

3) Formula Feed for Calves

a) Improvement of calf starter palatability

The 1st calf starter model was developed in November 2014 using feed that was easy to procure from local shops and by considering various aspects such as amino acid composition, palatability, and maximum feed intake. The document "Types and Characteristics of Fodder, which had been compiled in the 1st year, was referred for developing the calf starter. The 2nd calf starter model was developed in November 2015 with improved palatability.

b) Development of formula feed for calf rearing

The formula feed for calf rearing was developed using maize crush, wheat crush, wheat bran, cotton seed cake, guar meal, and sunflower seed. The TDN, crude fat value, and DM of this formula feed was 72.1, 18.2, and 88.7, respectively. The calf starter was continuously fed to weaned calves, but was replaced with this formula feed for calf rearing for two weeks before distribution to the farmers. The project provided this formula feed to the farmers only for three months after distributing the calves.

4) Distribution Plan

a) Number of distributed calves and destination of distribution

During the M/P study, three heads were distributed per farmer, following the Livestock Department officers' advice and the conventional practices in Sindh Province. However, the project decided to distribute only two heads per farmer and started to distribute claves to P/Fs in March 2015. The project provided advice on calf rearing technologies to the P/Fs upon distribution.

b) Selection of beneficiary farmers

The project developed a plan for distribution to surrounding farmers living near the P/Fs in the same village. This was an attempt to disseminate the outcomes at the P/F levels to the surrounding farmers. The project began its distribution in October 2015.

5) Technical Guidance upon and after Distribution

a) Technical guidance upon distribution

Because the rearing environment of farmers was different, the project found the most appropriate

place for calf rearing at each farm and tied the calves to the place. The project provided a water trough and feed trough and placed these at the designated place. The project also provided technical guidance on how to prepare hay from Gramineae grass and explained the importance of feeding hay.

	
Technical guidance on how to feed formula feed	Sufficient drinking water for calves

b) Technical guidance after distribution

The project performed regular and timely vaccination and deworming of the distributed calves. Simultaneously, the heart girth and body weight were measured and necessary technical guidance was provided as a monitoring activity.

(3) Dry Buffalo Salvation (2nd Year)

1) Technical Guidance to Farmers

The project started the activity at three cattle colony farmers in Hyderabad (two in the old cattle colony and one in the new cattle colony). The main aim of the activity was to improve the conception rate of milking buffaloes, considering that the percentage of salvaged dry buffaloes at the farms would increase if the results of conception after parturition were improved (if the period from one parturition to the next conception was shortened).

2) Reproductive Disorder Diagnosis and Treatment

Reproductive disorder analysis requires pregnancy diagnosis and accurate treatment by a skilled veterinarian. The project selected and provided technical guidance to two veterinarians including a Department officer and an individual veterinarian from the old cattle colony.

3) Livestock Sharing System Survey (2nd Year)

From November 2014 to July 2015, the project conducted a survey on the livestock sharing system and interviewed the P/Fs, breeder farmers, and their neighboring farmers (60 farmers in total).

The survey revealed that female buffalo sharing could be classified into the following three patterns.

1) Short term agreement – an owner entrusts either a heifer or dry buffalo to a caretaker who grows them, induces pregnancy, and keeps them until parturition
2) Long term agreement – an owner leases animals for five to 10 years to a caretaker over their lactation period
3) Monthly agreement – an owner entrusts pregnant animals to a caretaker until parturition with a fixed amount of monthly remuneration

Pattern 1 was the most common, whereas Pattern 2 was only found in Badin District. Pattern 3 was practiced by commercial farmers at cattle colonies.

In the pattern 1), female buffaloes have to become pregnant within a short agreement period, so it was considered difficult for "small scale farmers to increase livestock assets," which was one of the project targets. In pattern 2), farmers were more likely to increase their livestock assets, but it was rare that the farmers made a 10-year agreement; thus, there was little possibility of this contributing to the achievement of the project indicators. Therefore, the project practice of 2-calf distribution and 1-calf collection seemed to be a more realistic approach.

(4) MF Bank Survey (2nd Year)

The project selected TA District, where many MF banks had branches, as a survey area and interviewed four MF banks.

All MF banks offered loans to livestock farmers, which confirmed the farmers' needs for livestock business and the banks' efforts for product development. However, the banks faced challenges such as 1) a low maximum loan amount of their products and 2) the need of a few borrowers because of the instability of milk and meat markets. Another issue was that some banks did not know how their loan takers utilized the loans.

(5) Calf and Dry Buffalo Salvation (3rd Year)

1) 3rd Year Activity Policy

- Target number of calves reared at the center: Immediately after weaning, the project would bring newly born calves to a calf hatch. The annual target number of calves reared at the center was 50.
- Calf survival rate: The project would reinforce hygiene management of calves after birth and quarantine management at the center to maintain a disease prevention system. The target calf survival rate was more than 90%, equaling a mortality rate of less than 10%.
- The project would continuously distribute calves to small-scale farmers to verify a model from rearing to distribution. The project would conduct a survey on the situations of livestock MF to examine the possibility of application to the project activities.
- Sharing project outcomes: The project would develop the "Livestock Resource Utilization Textbook" compiling the technologies and outcomes accumulated at the center. The project would provide technical guidance to institutions and farmers who show interest and attempt to verify rearing at their

farms.

- Dry Buffalo Salvation**:** The project would develop and verify technologies that would enable earlier perception of calves after delivery at the cattle colony farmers. The project would provide technical guidance to Department officers and private veterinarians and comply with the activity outcomes.

2) Activity (Calf Salvation)

a) Calf survival rate

As shown in Table 3-18, the project achieved the target with only three deaths among 48 calves (survival rate, 93.7%) in the 1st year of the center and only five death cases among 53 calves (survival rate, 90.6%) in the 2nd year, totaling eight death cases in two years (survival rate, 92.1%). The reason for death in the first two cases in the 1st year was pneumonia, whereas that in the other case was diarrhea. The reason for death in four cases in the 2nd year was diarrhea, whereas that in the remaining case was a very rare accident of suffocation caused by calf's neck being caught between the calf hatch plates.

Table 3-18 Calf Survival and Mortality Rate

		Calves Introduced	Died	Survived
The 1st year	Heads	48	3	45
From mid-Nov 2014 until early Nov 2015	%		6.30%	93.70%
The 2nd year	Heads	53	5	48
From mid-Nov 2015 until early Nov 2016	%		9.40%	90.60%
Total over two years	Heads	101	8	93
	%		7.90%	92.10%

b) Daily gain results

As shown in Table 3-19, the project almost achieved the target of 500 g average daily gain between birth and distribution with a result of 439.7 ± 73.2 g in the 1st year. The average daily gain in the 2nd year was 359.7 ± 74.7 g, which was lower than that in the previous year, possibly because many trials such as provision of Japanese calf starter, provision of Japanese and French milk replacer, and provision of hay were conducted.

The project targeted an increase in daily gain and a decrease in rearing costs in the 2nd year. The project conducted many trials and verified technologies that compromised the daily gain results in health conditions.

Table 3-19 Comparison of Daily Gain between the 1st and 2nd Year (Unit: g)

		Birth Weight	DG from Birth to Weaning (g)		DG from Weaning to Distribution (g)		DG from Birth to Distribution (g)	
			Age (Day)	DG (g)	Age (Day)	DG (g)	Age (Day)	DG (g)
The 1st year	Avg.± STD	33.8±4.1	62.4±5.5	416.9±64.3	49.5±22.0	469.3±163	111.9±22.3	439.7±73.2
From mid-Nov 2014	Max.	42.2	90.0	571.0	139.0	828.1	205.0	578.0
until early Nov 2015	Min.	27.0	59.0	229.5	20.0	201.3	86.0	281.0
The 2nd year	Avg.± STD	33.7±4.6	61.5±3.5	350.9±81.1	50.4±16.3	360.5±131.9	114.4±16.6	359.7±74.7
From mid-Nov 2015	Max.	43.4	73.0	493.3	89.0	750.0	149.0	595.9
until early Nov 2016	Min.	25.0	51.0	165.0	21.0	152.4	82.0	235.8

c) Trial provision

Trial feed of Japanese calf starter

The project produced a calf starter made of locally available concentrate feed using an existing nutrition table. The calf starter contained more than 18% crude protein. The concentrate feeds used for the calf starter included corn, broken wheat, wheat bran, local beans, and molasses. The 60-day feed intake amount was low, with an average of 5,400 g and a minimum of 300 g. Therefore, the project conducted a comparison test between a Japanese calf starter and locally made calf starter. There was no change in palatability between the Japanese calf starter and the locally made calf starter; however, the Japanese calf starter showed higher results in daily gain than the locally made calf starter.

Trial feed of Japanese milk replacer

The project performed a trial feed with 20 kg of Japanese milk replacer at the calf salvation center. The results were as follows:

① Compared to calves fed buffalo milk, calves fed with the milk replacer showed lower daily gain but normal health conditions. Use of the milk replacer was effective for reducing the rearing costs.
② To obtain the same levels of 500 g daily gain as calves fed with buffalo milk, the difference in ingredients needs to be considered before using the milk replacer. Before this, the cost needs to be calculated.

d) Hay survey

Hay preparation survey

The project fed calves with hay made from wild grass named "Chabbar," belonging to a group of star grass. Usually, one kg of hay is produced from five kg of pasture grass (20%), but in the case of Chabbar 6.17 kg of hay was produced from 15.67 kg/bag of wild grass (39.4%). The production cost was Rs.24.3/kg because the price of Chabbar was Rs.150/bag.

Trial of non-provision of hay during suckling period

Because the calf starter intake of Kundhi buffalo calves was too low, the project conducted a trial of non-provision of hay during the suckling period to determine whether calf starter intake would increase. Compared to calves fed without hay, calves fed hay showed more than double intake as well as improved daily gain results. Therefore, the project decided to continuously feed the calves with hay.

e) Results of distribution of 3-month calves

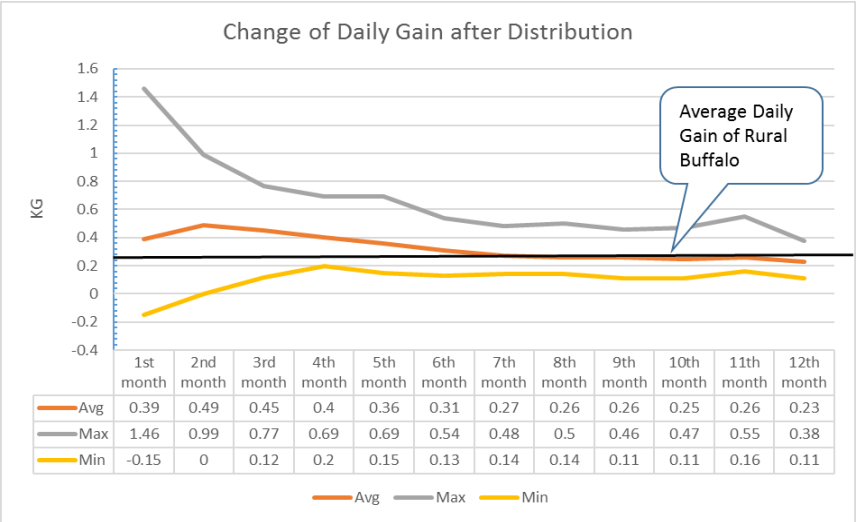
The project distributed 3-month calves on a JICA budget for 26 months[17] from March 2015 (2nd year) until April 2017 (4th year). Two calves per farmer were distributed to 48 farmers, resulting in a total of 96 distributed calves. Table 3-20 shows the breakdown of the number of farmers who received calves.

[17] Few-days calf distribution completed in July 2017. The average survival rate of both 3-month and few-days calf distribution was 92.1%.

Table 3-20 Number of Farmers Who Received Calves

	Male farmers	Female farmers
P/F (1st group)	11	1
Surrounding farmers (P/F1)	6	13
P/F (2nd group)	13	-
Surrounding farmers (P/F2)	2	2
Total	32	16

Figure 3-18 shows the changes in the daily gain of calves after one to 12 months after distribution. The average daily gain of calves in rural Sindh was approximately 250 g. The project provided formula feed for calves during the first three months after distribution. Thus, the average daily gain of calves shifted between 400 g and 500 g during the first month. After that, the daily gain of calves differed among farmers, depending on the fodder capacity and feeding management, but gradually decreased to the same level as that in rural Sindh. However, some farmers maintained an average daily gain of more than 250 g. The calves at these farms showed steady growth.



	1st month	2nd month	3rd month	4th month	5th month	6th month	7th month	8th month	9th month	10th month	11th month	12th month
Avg	0.39	0.49	0.45	0.4	0.36	0.31	0.27	0.26	0.26	0.25	0.26	0.23
Max	1.46	0.99	0.77	0.69	0.69	0.54	0.48	0.5	0.46	0.47	0.55	0.38
Min	-0.15	0	0.12	0.2	0.15	0.13	0.14	0.14	0.11	0.11	0.16	0.11

Figure 3-18 Changes in Daily Gain of Calves after Distribution

f) Follow-up of calves distributed during the M/P study

During the M/P study, the study team (now the project team) distributed calves to eight farmers. The contracts with farmers expired in the 2nd year. After that, the project undertook a follow-up of reproductive diagnosis and treatment of heifers so that the heifers, which then belonged to the farmers, would become pregnant, give birth to a new calf, produce milk, and bring income to the farmers. Four heifers became pregnant, and two of them gave birth to calves. Milk production was high, indicating a high milking capacity of the buffaloes at the cattle colony farmers.

		
Reproductive diagnosis and treatment	Baby calf and a mother heifer	Distributed calf after delivery (with an ideal wedge-shaped udder)

g) Calf salvation activity introductory W/S

The project organized the 1st calf salvation activity introductory W/S on November 24, 2016. The project made prior visits to farmers and NGOs; of these, six farmers and one NGO, as well as a Department officer in the same district where the farmers lived attended the W/S. The W/S comprised three components: i) an overview of the calf salvation activity, ii) visit to the calf salvation center, and iii) a technical lecture on feeding management, fodder, and health. The C/Ps in charge of animal assets, feeding management, fodder, and animal health delivered lectures on the related topics.

h) MF survey

There is a possibility of selling salvaged calves to farmers when the calf rearing model is widely applied among governmental organizations, private farmers, NGOs, etc., in the near future. The project conducted a desk and interview survey on the MF services accessible in the project area to examine the possibility of using MF as a fund for farmers to purchase calves.

The survey found that both the Pakistani government and private banks considered lending to the livestock sector as important, and thus had been increasing the loan portfolio size sharply. The survey also confirmed that farmers who utilized MF services had been steadily increasing their animal assets. However, the other finding was that many issues remained for small-scale farmers such as the project beneficiaries, to use the MF services.

2) Activity (Dry Buffalo Salvation)

The project started the reproductive diagnosis and treatment of buffaloes 30–45 days post-delivery at the cattle colony farms. The project continued bi-weekly technical guidance and verified the technologies to shorten the delivery period.

(6) Calf and Dry Buffalo Salvation (4th Year)

1) Activity (Calf Salvation)

a) Implementation of the 1st and 2nd models

<u>1st model</u>

The Department's PC-I budget was available in August 2017. The project purchased 20 calves with

the PC-I budget and reared three 3-month old calves[18] to two farmers. The project named the model of rearing 3-month old calves and distributing two calves to farmers as the 1st model.

Results

The project analyzed the daily gain (g) of 96 calves distributed under the 1st model in two years. The average daily gain from birth until distribution was 440 g in the 1st year and 379 g in the 2nd year.

Table 3-21 Body Weight (kg) and Daily Gain (g) of Calves

The 1st year	n=	Age (Day)			Weight (Kg)		
		Average	Max.	Min.	Average	Max.	Min.
Birth	48	0			33.8 ±4.2	42.2	27.0
Weaning	45	62.4	90	59	59.6 ±4.8	69.0	51.0
Distribution	45	111.9	205	86	82.8 ±13.5	118.0	61.0
					Daily weight gain D.G. (g)		
					Average	Max.	Min.
D.G. Between Birth and Weaning					416.9 ±64.3	571.0	229.5
D.G. Between Weaning and Distribution					469.3 ±135.3	828.1	201.3
D.G. Between Birth and Distribution					439.7 ±73.2	578.0	281.0
The 2nd year	n=	Age (Day)			Weight (Kg)		
		Average	Max.	Min.	Average	Max.	Min.
Birth	59	0			33.7 ±4.5	43.4	25.0
Weaning	51	61.2	68	59	55.3 ±5.0	66.0	42.0
Distribution	51	112.7	149	87	76.7 ±12.6	113.0	54.0
					Daily weight gain D.G. (g)		
					Average	Max.	Min.
D.G. Between Birth and Weaning					352.4 ±79.1	524.6	173.3
D.G. Between Weaning and Distribution					405.6 ±146.1	758.1	152.4
D.G. Between Birth and Distribution					379.0 ±74.1	600.0	263.6

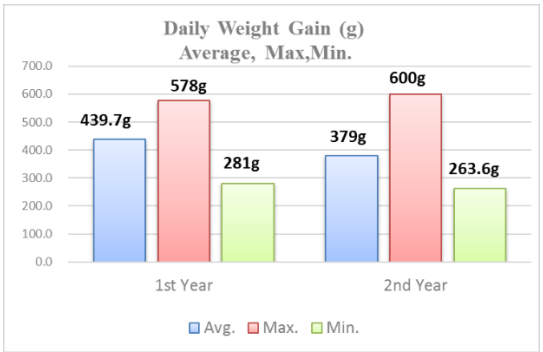


Figure 3-19 Daily Gain (g) of Calves

Milk feeding unit

2nd model

The project started the 2nd model of one few-days old calf distribution for fees in December 2016. One few-days old calf was experimentally distributed to a farmer in December 2016. The full-scale trial began in May 2017. In August 2017, the PC-I budget became available, and the project thus switched to distribution with the PC-I budget.

As of December 2017, nine of the 27 distributed calves died (33%). The project interviewed the farmers to determine the reasons and found that: i) the farmers were not able to change their conventional rearing technologies only by receiving technical guidance upon distribution; ii) that the milk quantity was small (four kg/day was the project's instruction), and iii) that the calves had not eaten the calf starter because water had not been provided continuously.

Therefore, the project took the following measures and provided guidance as follows: i) to change

[18] One calf died at the center, so the other two calves were distributed.

early weaning age from two months old to three months old in principle but to decide the actual weaning date together with the C/Ps during their visits to farmers, and ii) to utilize a newly developed milk feeding unit that enabled continuous provision of water and hay.

b) Calf salvation activity introductory W/S

The project organized the 2nd calf salvation activity introductory W/S in April 2017. In total, 21 people, including three commercial farmers at cattle colonies, four farmers who had received calves, three NGOs, and Department officers participated in the W/S. The C/Ps on livestock assets, feeding management, fodder, and animal health delivered lectures on the overview of calf salvation activity and technical lectures on feeding management, fodder, and animal health. The Sindhi version of the "Textbook for Calf Salvation" was developed before the 2nd W/S and distributed to the participants.

		
Calf salvation W/S	Visit to the calf salvation center	Textbook (Sindhi version)

A HANDS veterinarian joined monthly measurement at the P/F and measured the heart girth of a distributed calf.

c) Technical support to HANDS for the calf salvation and distribution activity

The NGO HANDS, which had participated in the above W/S, decided to start the calf salvation activity; therefore, the project started providing technical support in November 2017. HANDS is a Pakistani NGO established in 1979 and has its headquarters in Karachi. Through this activity, HANDS aimed to provide assets to poor farmers and improve their livelihoods and food security. Having sympathy for their vision, the project provided them with technical guidance.

d) Relocation of the calf salvation center and a new calf hatch model

In September 2017, due to road expansion, the project moved its center to the inner part of the Department site. As the new center was less spacious than the previous one, the project connected the existing calf hatches to form a fixed and coupled type calf hatch. The project also developed another model of fixed calf hatches for cases where there enough space is not available at the cattle colony farms or commercial livestock farmers.

Front view of the new calf salvation center

2) Activity (Dry Buffalo Salvation)

The project conducted a trial for improving the reproductive capacity of parous buffaloes for their early conception after parturition at the Nagori farm in the new cattle colony. Starting in November 2019, the project continued to provide bi-weekly or tri-weekly reproductive diagnosis by rectal palpation and the necessary treatment for 20 buffaloes that had been delivered in October 2016.

(7) Calf and Dry Buffalo Salvation (5th Year)

1) Activity (Calf Salvation)

a) Calf salvation center facility

<u>Calf hatch</u>

The fixed-type calf hatch was completed in 2018 after many trials and errors. Applying the lessons from the experience of preparing a milking shed from a GI pipe, the project developed the roofs of a fixed-type calf hatch and a paddock for group rearing, fences for a paddock, and a retainer for measuring calf weight.

Fixed type calf hatch and a roof for avoiding sunshade

Paddock for group rearing

GI pipe calf retainer

Guidance on center operation

Seven members including one V/O, two S/As, four workers, and one sweeper recruited by the Department with the PC-I budget, were assigned to the calf center. The C/Ps on feeding management, fodder, animal health, and livestock assets were mainly responsible for the activity during the period of technology verification by the project, but immediately after the responsibility was transferred to the Department, the number of inappropriate calf rearing cases, diarrhea cases, and death cases increased because of the unclear order line and ambiguity in responsibilities. Therefore, the project provided technical guidance to strictly enforce disinfection and reinforce the quarantine system. The center staff members restarted the process of disinfecting the Department site and calf hatches, which greatly decreased the number of diarrhea cases.

b) Introduction of calves to the calf salvation center, and the no. of distributed calves

Introduction and distribution

In all, 101 calves were introduced to the center with the PC-I budget from the 4th year until January 2021. The center demonstrated the rearing and distribution of few-days old, one month old, and three months old calves. Table 3-22 shows the survival rates during this period.

Table 3-22 Number of Introduced Calves and Death Cases with the PC-I Budget

(August 2017 to January 2019)

	Introduced	Died at the Center	Culled	Died during Transportation	Survival rate
Aug. to Dec. 2017	20	2	0	0	90%
Aug. 2018 to Jan. 2019	81	5	2	1	93.8%
Subtotal	101	7	2	1	93%

Table 3-23 summarizes the results of calf distribution and the survival rate at the end of January 2019. Due to the Department budgetary issues, the distribution of few-day old calves was prioritized.

Table 3-23 Results of Calf Distribution with PC-I Budget and the Survival Rate

	August to December 2017 (4th year)		August 2018 to January 2019 (5th year)	
	No. of heads distributed	No. of heads that survived	No. of heads distributed	No. of heads that survived
A few days	16	10	63	60
1 month old			2	2
3 months old	2	2	1	1
Subtotal	18	12 (67%)	66[19]	63 (95%)

The calf salvation activity was suspended because of the delay in budget disbursement by the Sindh Government, but it resumed in late September 2019 with calf introduction. As shown in Table 3-24, the number of introduced calves between September 2019 and March 2020 was 43, whereas the number of deaths was five (11.6%). Ten of the other 38 calves were reared until they were three months old and were

[19] Seven heads were reared at the center; thus, there was a 7-head difference compared to the 73 live heads

then distributed to farmers in Matiari District under the SMFB scheme. The remaining 28 calves were distributed at the age of a few days.

Table 3-24 Results at the Calf Salvation Center

Month	Introduced	Introduced (before this month) + Introduced	Accident		Total reared at the center	Distributed		Total remaining at the center
			Died	Culled		Few days	Three months	
September	4	0	0	0	4	0	0	4
October	9	13	2	1	10	4	0	6
November	3	9	0	0	9	0	0	9
December	8	17	0	0	17	6	0	11
January	8	19	0	0	19	7	5	7
Feb + Mar	11	18	2	0	16	11	5	0
Total	43		4	1		28	10	

After April 2020, the center distributed only one few day old calf, and reared 10 calves for three months. One of 10 calves died, and the remaining nine were distributed on June 29, using a MF scheme from a NGO, NRSP. The total number of introduced calves was 11, whereas that of the distributed calves was 10. The average age of the distributed calves as on the previous day of distribution was 92 days. The average daily gain was 365 g, as of May 28, the measurement day. The highest value was 606 g, which showed relatively good results.

c) Recovery of heifers

According to the agreement between the Department and farmers, the farmers can own one of two distributed 3-month old heifers as their own assets after three years since distribution but have to return one heifer to the Department. As three years had passed since the first distribution case, the Department initiated the procedure of recovering one heifer and selling the heifer by auction. Nine heifers were sold by auction in October 2018, and 16 were sold by auction in January 2019. The auction prices were between Rs.27,000 and Rs.95,000.

Upon recovery, the Department set a certain period to confirm the farmer's willingness to purchase a heifer. The purchasing price was Rs.150/kg (live weight). The Department announced an auction in the newspapers only when the farmer did not purchase the heifer.

d) Calf salvation case of Mr. Amir, a cattle colony commercial farmer

Mr. Haji Amir, who had been receiving technical guidance since the M/P study period, started to rear the calves born at his farm. By August 2018, he had reared 21 heifers and 20 young male buffalos, with a total of 41 heads. According to the monthly body weight measurement results, the average body weight was 218.5 kg, with a maximum of 440 kg and a minimum of 113 kg.

	
Female and male buffaloes reared at Mr. Amir's farm	The JICA Mission observed Mr. Amir's salvation case

e) Case from the M/P study

In September 2015 (the 2nd year of the project), the project handed over heifers to eight farmers who had participated in the pilot calf salvation activity during the M/P study. At one of the eight farmers, Ms. Sakina in Hyderabad District, two female buffaloes gave birth to four calves (two male calves) during three years and four months between September 2015 and January 2019. As a result. Ms. Sakina and her two daughters owned four female buffaloes in total.

The number of such cases is expected to increase in the future, where beneficiary farmers increase the number of buffaloes every time new buffaloes are born. In this manner, the calf salvation activity can contribute to increase small-scale farmers' assets.

f) Calf salvation activity introductory W/S

The 3rd calf salvation W/S was organized on August 16, 2018, with the PC-I budget. One commercial farmer in the cattle colony, four commercial farmers, four NGOs and three MF banks, totaling 16 participants attended the W/S.

g) Calf salvation activity case of livestock stakeholder

The project started technical guidance on the HANDS calf salvation activity in the 4th year. HANDS began the activity by facility installation, and then distributed 65 heads in 2018, 48 heads in 2019, and 25 heads in 2020, totaling 138 heads, to farmers in Sujawal District. The calves were distributed to poor female farmers at the age of 60 days. The activity has been suspended since March 2021.

h) Coordination with financing institutions

The project started an activity to respond to the TE Mission's comment that 'the model is not said to be economically viable without initial financial support to small-scale farmers. From November 2018 to January 2019, the project visited candidate financial institutions that could provide funds for small-scale farmers to purchase calves. The project discussed the possibility of coordination and obtained a consensus from SMFB.

This was one of the calf salvation activity financing schemes, being the 3rd model of calf salvation activity, in which a calf beneficiary farmer receives a loan from SMFB upon the purchase of a calf and completes loan repayment upon distribution. In March 2019, the draft Memorandum of Understanding (MOU) was prepared by the Livestock Department and SMFB. The MOU was first approved by the Legal Department and later by the Secretary Livestock. On July 24, 2020, two parties exchanged the MOU.

On November 29, a W/S was held in the Matiari District jointly with the district Department office and the project. In the W/S, a financing plan prepared by SMFB was approved by landlords and farmers. On January 23, 2020, a bank account in the name of the Calf Salvation Center was opened at SMFB, and the funds for calf rearing were transferred from SMBF to the account. On February 14, the first five calves were distributed to the farmers. All five beneficiaries who received calves were female farmers. The average daily gain of the distributed calves was 459 g, which was a result of the good conditions and large bodies of the calves.

	
Dr. Naeem, the C/P in charge, the Director of Animal Husbandry, a village leader, Dr. Jokhio, the P/M, a beneficiary farmer, and the representative of the SMFB	Five female calves distributed to farmers by using SMFB loans

On March 19, 2020, five other calves were distributed to farmers in another village. Some of the farmers' repayment to SMFB was delayed due to the lockdown measures for COVID-19 prevention, but all the loans had been repaid by February 2021.

In 2021, an NGO named NRSP showed interest in the calf salvation activity, and decided to distribute calves to farmers in TA District using MF without any interest. On June 22, 2021, an MOU was exchanged between the Department and NRSP. On 29th June, nine calves were distributed to farmers in a village in TA District.

2) Activity (Dry Buffalo Salvation)

The project continued its activity from the 4th year. The project targeted milking buffaloes of 40 to 45 days after delivery and applied the technology model described below.

1) Confirmation of the mother buffalo conditions (milk yield, mastitis, BCS, etc.)
2) Diagnosis by rectal palpation after 40–45 days after delivery (diagnosis of the levels of reproductive organ recovery and reproductive disorders)
3) Proper treatment of reproductive disorders
4) Checking and recording the estrus conditions
5) Mating with a bull with normal ability and reproductive function
6) Pregnancy diagnosis

The project felt confident with the results of the trial at Nagori Farm in the 4th year, which confirmed

the perception of 12 out of 20 buffaloes after six months of delivery. In the 5th year, the project verified the model for improving the conception rate at Mr. Haji Amir's farm in the old cattle colony. The number of targeted buffaloes was 18, of which 15 were pregnant (83%). The number of pregnant calves at six months after delivery was 12 (66.7%) in the 5th year, the project visited Mr. Haji Amir's farm for reproductive disorder training. C/Ps provided technical guidance to the training participants who demonstrated the technologies.

(8) Monitoring and Evaluation of the Distributed Female Calf Salvation Plan

1) Background and History

In 2019, eight Agricultural Emergency Initiatives suggested by Imran Khan, the Prime Minister of Pakistan, were approved by the Executive Committee of the National Economic Council. One of the eight initiatives was a calf salvation plan, but it only targeted male calves in Punjab Province. Although the project demonstrated the calf salvation system, which "distributes two female calves and recovers one calf," unfortunately, such a plan was not included in the abovementioned emergency initiative. The main reason for this was considered that Pakistani government stakeholders did not understand the project's outcome on the subject. Therefore, JICA dispatched a livestock study mission to conduct a monitoring survey to monitor and evaluate the project and to develop a realistic proposal. On this occasion, the mission also verified an "economically viable model," which is the PDM indicator 2-2, and includes the methods for establishing such model in the proposal.

2) Results of the Monitoring Survey

a) Profit and loss of the calf salvation center

Rearing cost calculation (106 heads in the 1st and 2nd year)

The project verified the rearing and distribution model at the center during the original project period. The project assigned three workers to the center and distributed 95 calves during the two years of the 1st and 2nd year. The calves were reared until they reached three months of age and were then distributed to the farmers. The project provided formula feed for calf rearing for three months after distribution and donated a water trough and feeding trough. As a result, the rearing cost per head was Rs.39,342. The fresh milk cost was Rs.14,960, representing 38% of the total cost. The labor cost was Rs.5,760. The sum of these two costs was Rs.20,720, which represented 53% of the total cost.

Average recovery price per head

The average recovery price per head was Rs.52,676 for P/Fs and Rs.44,281 for the surrounding farmers. The average of the above two was Rs.48,479, which indicated a loss of Rs.30,205 compared to the 2-calf rearing cost of Rs.78,684.

Table 3-25 Comparison of average weight and average recovery price between the P/Fs and surrounding farmers

	P/F				Surrounding Farmers				Total no. of heads
	No. of heads	Average	Max	Min	No. of heads	Average	Max	Min.	
Average Weight	47	325.9	560.0	170.0	45	282.1	510.0	120.0	92
Average Price	47	52,676	98,000	27,000	45	44,281	77,000	22,000	92

Suggestion

To improve economic viability, the project suggested large-scale breeding, which could reduce the rearing cost per head by establishing 50 fixed-type calf hatches for one shed and mobilizing three workers for rearing 250 calves. Furthermore, the transportation cost can also be reduced if the center rears calves until they become six months old because the center no longer has to distribute formula feed for 4 to 6-month old calves to beneficiary farmers. Use of milk replacers can further decrease the rearing cost to Rs.26,889 per head, which brings the total cost of rearing two calves to only Rs.53,778.

The average recovery price verified in the 1st and 2nd year was Rs.48,479. It is possible to increase the future recovery price by increasing the daily gain of calves, lowering the age of mating and then improving the conception rate through improved technical guidance by Department officers.

b) Comparison of the percentage of milking buffaloes between the collection and monitoring times

At collection

The average age at the time of collection was 3.6 years, with a maximum of 4.9 years and a minimum of 3.1 years. The percentage of milking buffaloes was only 6.4% for P/Fs and 2.2% for the surrounding farmers, and the average of the two categories was 4.3%.

At monitoring

The project conducted a monitoring survey on the distributed calves as of December 15, 2019. Most of the calves were either already sold or missing, so it was difficult to track their records. Therefore, the number of calves that could be monitored was only 46, which was half the number of recovered calves. The average age of these 46 calves was 4.3 years. The percentages of milking buffaloes at the P/Fs and surrounding farmers were 20.84% and 13.6%, respectively, which were still low. The average of the two categories was 17.4%.

The project considered that the reasons for late conception and late delivery were the late maturity nature of the breed and late growth as a result of less nutritious feed provision. It is possible that rapid growth and early conception will be achieved when District V/Os and S/As can provide technical guidance to beneficiary farmers in future after learning appropriate technologies. Consequently, the recovery price per hectare will also increase. Further efforts on conception rate improvement are required from the Department because the price of a buffalo increases by several tens of thousands of rupees if the buffalo is pregnant and even goes beyond Rs.100,000 before delivery.

3.5.2 Products

Table 3-26 lists technical cooperation products for Output 2.

Table 3-26 List of the Technical Products of the Project[20]

Type	Title	Submission Year	Contents	Appendix No.
Farmers' Current Situation Survey	Survey on Sharing of Buffaloes in the Project Area	2nd year	Facts about the traditional sharing system practiced in rural Sindh	T2-1
Textbook for Utilizing Livestock Resources	Textbook for Calf and Dry Buffalo Salvation	4th year	A textbook on calf and dry buffalo salvation	T2-2
	Textbook for Calf Salvation (Sindhi Version)	4th year	A Sindhi version of the calf salvation component of the "Textbook for Utilizing Livestock Resources"	T2-3
	Manual for Distribution of Calves	2nd year	A manual for distribution of calves from the salvation center to a farmer.	T2-4
	Guideline for Treatment of a Calf	2nd year	A guideline for treatment of calves at the calf salvation center	T2-5

Table 3-27 lists other products for Output 2.

Table 3-27 List of the Other Products of the Project

Title	Submission Year	Contents	Appendix No.
Results of Interviews at Microfinance Banks	2nd year	Survey on MF institutions and their service	Z2-1
Report on the Current Situation of Livestock Microfinance in Sindh	3rd year	Report on MF	Z2-2
Proposal of the New Project for Buffalo Calf Salvation	5th year	Establish new calf centers in Hyderabad and Karachi that will enable large-scale breeding and distribute 6-month old calves	Z2-3

3.5.3 Levels of Achievement of Indicators

Provided below is a summary of PDM Ver. 4 Output 2 indicators, and Table 3-28 provides a summary of the levels of achievement as of June 30, 2021.

Narrative Summary	Objectively Verifiable Indicators
2. The methods for utilizing livestock resources are verified.	2-1. The survival rate of calves in 3 months after birth at the Calf Salvation Center exceeds 90% with the technology for salvaging new born calves. 2-2. The methods of calf salvation including rearing by farmers are proven to be economically viable. 2-3. It is confirmed that dry buffaloes are salvaged with improved reproduction technologies. 2-4. The counterparts have the capacity to promote effective use of livestock resources to the public and private entities according to the guidelines prepared by the Project.

[20] The SOP for Output 2 activities is included in Table 3-58.

Table 3-28 Levels of Achievement of Indicators

Indicator No.	Levels of Achievement
2-1	The average survival rate of 3-month old calves in the past two years was confirmed to be 92% in the 3rd year. Therefore, the indicators were achieved.
2-2	The "salvaged calf distribution and rearing system" has three models. Model 1 (distribution of two 3-month old calves and collection of one heifer) and Model 2 (one few-day old calf distribution for a fee) were verified with both the JICA budget and PC-I budget. However, it is yet to be confirmed as "economically viable". One of the two main issues is that as the TE Mission pointed out, "the models cannot be said to be economically viable without initial financial support to small-scale farmers". Therefore, the project developed the Model 3, which uses MF services. In 2020, the calf center distributed 10 calves to 10 farmers in Matiari District in coordination with SMFB. The rearing cost of Rs.25,000 per head was transferred to the center's bank account, so that the model became economically viable. Some of the farmers' repayment of the loans was delayed because of the lockdown measures under the COVID-19 pandemic, but all the loans were repaid in the end. In 2021, the center distributed nine calves to the farmers in TA district by using the NRSP's zero interest rate MF service. Through these two practices, Model 3 was verified. The other issue was the high rearing cost at the calf salvation center. The Department faces many constraints against making the activity economically viable because unlike private institutions, it is difficult to smoothly disburse the budget and to timely procure equipment and also because the human resource cost for many staff members assigned to the center is expensive. The JICA mission undertook a monitoring survey on the calf salvation activity from December 2019 to January 2020. Based on the survey, the JICA mission suggested a plan of establishing large-scale calf centers that enable large-scale rearing of several hundred heads in Hyderabad and in Karachi. This plan will decrease the 6-month rearing cost to Rs.25,000/head, and is thus expected to achieve economic viability of the activity.
2-3	The cases were confirmed at Nagori farm in the 4th year and at Mr. Haji Amir's farm in the old cattle colony in the 5th year. Therefore, the indicator was achieved.
2-4	C/Ps can now respond to inquiries from individual farmers and organize a calf salvation W/S. The C/Ps have accumulated a lot of experience through technical guidance to public and private stakeholders in the livestock sector. Therefore, the indicator was achieved.

3.5.4 Project Sustainability after Project Completion

Both the project purpose indicator and the overall goal indicator for Output 2 are "Some stakeholders (e.g., commercial farmers, NGOs, target groups) in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes."

For calf salvation, the project verified models 1 to 3 and achieved the above indicator. Decreasing the rearing cost is important to the sustainability of distributing calves to more poor farmers; therefore, the JICA mission has submitted a proposal to the Livestock Department for establishing large-scale rearing centers that enable large-scale breeding. Unfortunately, the activity proposal is yet to be approved as of June

2021. Because technical transfer to C/Ps is already completed and the workers know the routine work very well, it is expected that they will continue the calf salvation activity at the center.

For dry buffalo salvation, trainees who participated in the reproductive disorder training course continued providing reproduction guidance to the farmers at the cattle colony. As a result, the conception rate of dry buffaloes is improving daily. A reproductive disorder diagnosis and treatment training course is included in the 3-year action plan, and the Department is thus expected to continue it.

3.6 Output 3: Activities, Products, and Levels of Achievement

3.6.1 Activities

(1) PRA Survey (1st and 2nd year)

The project team conducted a PRA survey in the 1st and 2nd year, respectively, to understand the social structure of rural Sindh, such as the life of rural residents, information dissemination flow inside/outside of villages, and decision-making processes. The purpose of this survey was to consider effective information dissemination and technical guidance for small-scale farmers including women, and to reflect the survey results into an extension plan and implement extension activities.

In the 1st year, four villages were selected from the pilot village as the target villages for the PRA survey. This survey was conducted only with male farmers. In the 2nd year, the PRA survey for female farmers was conducted in the same village as the 1st year. In addition, five other villages were newly selected as the survey targets from the pilot villages, and surveys for both male and female farmers were conducted. For target village selection, the number of biradaris and religions (Islam or Hindu) were considered.

Based on the survey result in nine villages, the social structure of the community was analyzed from the viewpoint of both men and women. Then, the PRA Survey Report and PRA Survey Report (second) were prepared.

	
PRA survey with male farmers	PRA survey with female farmers

(2) Interview Survey of Extension-related Institutions

In the 1st year, the project team conducted interview surveys with the following nine extension-related institutions in the province:

LDDB, Livestock and Dairy Development Board (Milk and Meat Sections)
BBSYDP, Benazir Bhutto Shaeed Youth Development Program
PDDC, Pakistan Dairy Development Company
SPO, Strengthening Participatory Organization
TRDP, Thardeep Rural Development Programme
SAFWCO, Sindh Agricultural and Forestry Workers Coordinating Organization
NRSP, National Rural Support Programme
RDF, Rural Development Foundation
ASLP II, Agriculture Sector Linkage Program Phase II

There were the following three purposes.

i) To collect the existing extension-related materials and introduce to the project if possible
ii) To determine the whereabouts of extension workers nurtured at these institutions and to explore possible cooperation with the project as invaluable human resources
iii) To grasp learnings from the extension activities by these institutions to improve the extension activities of the project

The results of the interviews are mentioned at the interview survey report.

(3) Discussions with Related Organizations

In the 2nd year, to confirm the suitability and feasibility of the Extension Plan (draft) and to consider the possibility of cooperation in extension activities, the project held discussions with the Sindh Agricultural University and the Department of Agricultural Extension on the Extension Plan (draft). The extension plan (draft) was finalized based on their comments.

The Sindh Agricultural University recognized the Extension Plan (draft) positively because it was prepared based on the result of the PRA survey. However, it was pointed out that i) the target number of 7,500 farmers was too large to disseminate the appropriate technology within the remaining three years, and ii) it was culturally difficult to conduct mixed-gender training in the villages.

Regarding the Extension Plan (draft), the Department of Agricultural Extension (DAE) pointed out that implementation of mixed-gender training is very difficult; however, it is worth trying. Moreover, the D/G of the DAE proposed that he could assign his female extension workers to the project for one week per month to cooperate with the project extension activities under his authority. Therefore, the project discussed with the D/G of the Livestock Department and other staff to collaborate with the DAE. However, this idea was withdrawn because they openly expressed their displeasure.

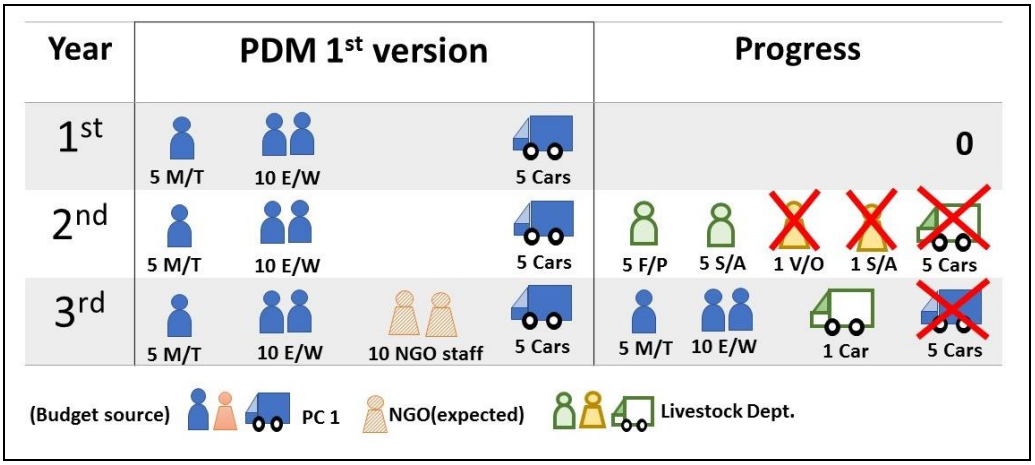
(4) Formation of the Extension Team (3rd year)

The Livestock Department did not have any experience with technology dissemination or an extension structure. Therefore, it was a big challenge for the project to expand the extension activities in the target area. The project thus faced major obstacles during the project period.

First, the Department was supposed to employ the extension team, M/Ts and E/Ws, temporarily with the PC-I budget in the 1st year. Second, the Department was supposed to procure the vehicles for the extension activity in each district. However, internal procedures of the Sindh government were stagnant, and

as a result both staff recruitment and vehicle procurement were significantly delayed. Therefore, a large gap was produced between the plan at the beginning of the project (PDM Ver. 1) and the progress of staff recruitment and vehicle procurement in the 3rd year, as shown in Table 3-29.

Table 3-29 Plan in PDM Ver. 1 and Progress of M/T and E/W Recruitment and Car Procurement



As a countermeasure, a temporary extension team was formed by five F/Ps of the project and five S/As of the Department. This team implemented social mapping and sensitization meetings at the pilot villages. In the 3rd year, five M/Ts and 10 E/Ws were assigned,[21] and farmer training for male farmers in each village was started. However, five vehicles for the district extension team (one vehicle per district) were procured in the 4th year. Therefore, the extension activity area in the 3rd year was limited. In the 4th year, district vehicles were procured, and 10 female E/Ws[22] were also assigned. Finally, the project could start extension activity in the full scale, including the female farmers.

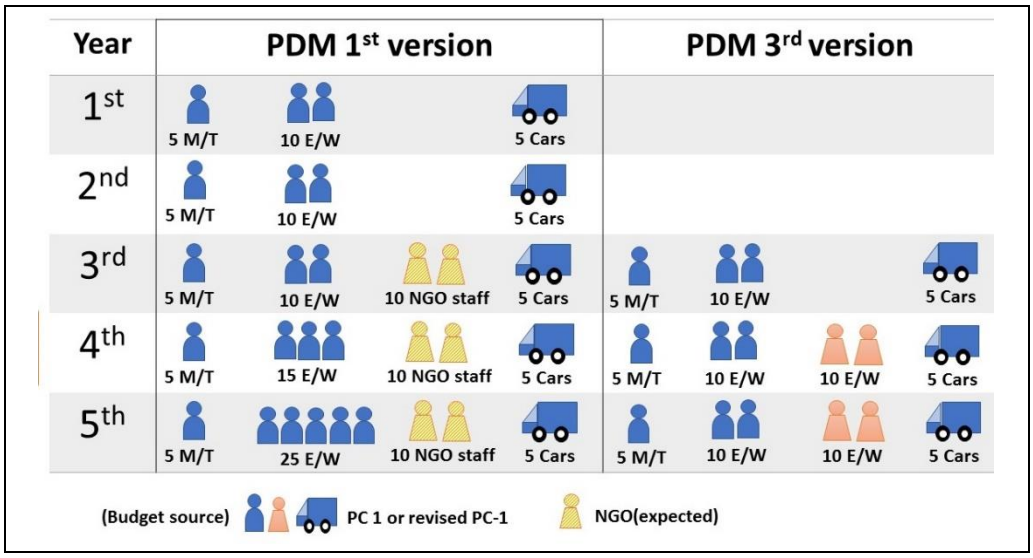
The planned number of M/Ts, E/Ws,[23] and cars in PDM Ver. 1 and Ver. 3 are shown in Table 3-30. There were two main modification points from PDM Ver. 1 to Ver. 3. One is that the number of male E/Ws was planned to be increased in the 4th and 5th year. However, the recruitment process took a long time and posed a heavy burden. Therefore, the project decided to keep the number of male E/Ws at 10 until the end of the project. Further, the project originally planned to collaborate with an NGO to provide farmer training for female farmers. However, because the project later decided to form the project extension team that consists of temporarily-hired Department officers at each district instead of collaborating with NGOs, 10 female E/Ws were employed in the revised PC-I.

[21] At the same time, a G/S and S/M were employed at the provincial level. The number of M/Ts and male E/Ws were later decreased to four and nine, respectively.

[22] 10 female E/Ws were employed; however, they were later decreased to eight members. Further, one more female E/W left the project in November 2020. Therefore, the final number of female E/Ws was seven.

[23] In PDM ver. 1, collaboration with an NGO was planned for the extension activity targeting female farmers.

Table 3-30 Number of M/Ts, E/Ws, and Cars in PDM Ver. 1 and Ver. 3



The extension structure of the project is shown in Figure 3-20. At the provincial level, G/S performed as the extension team leader, whereas S/M formed the members. At the district level, one V/O was assigned as M/T, whereas two female V/Os and two male S/As formed a total of four staff assigned as E/Ws.

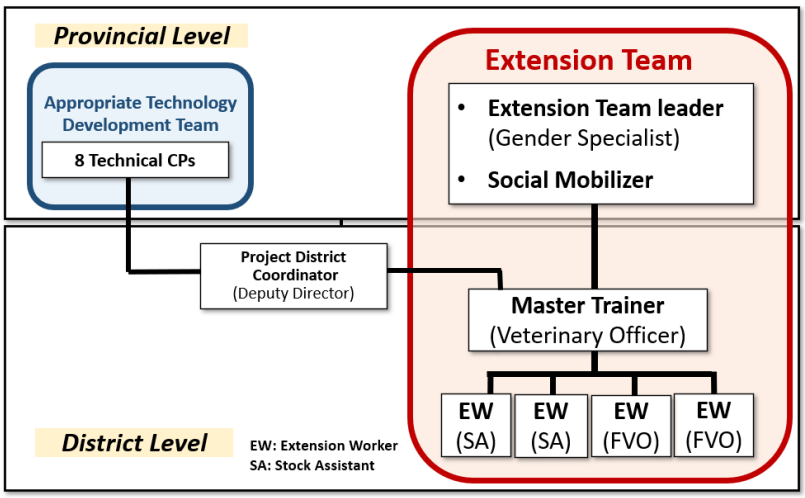


Figure 3-20 Extension Structure of the Project

(5) Extension Team Training

From the 2nd year, extension team training was conducted continuously, to make the extension team understand the project and extension activity, to learn preparation of the farmer training such as social mapping and sensitization meeting), and to learn how to conduct the farmer training. The extension team training sessions conducted from the 2nd to the 5th year are shown in Table 3-31.

Table 3-31 List of Conducted Sessions of the Extension Team Training from the 2nd year to the 5th Year

Year	Times	Period	Outline	Target
2nd	1	October, 2015	1) Project orientation, 2) Team building, 3) Social mobilization	Temporary extension Team (5 F/Ps, 5 S/As)
	2	November to December, 2015	1) Feeding management, 2) Animal health (Mastitis), 3) Calf rearing and diarrhea, 4) Animal reproduction, 5) Review of the extension plan and role of extension workers, 6) Review of communication skills, 7) Practice of social mapping at the pilot village	Temporary extension Team (5 F/Ps, 5 S/As)
3rd	3	April, 2016	Sensitization meeting	Temporary extension Team (5 F/Ps, 5 S/As)
	4	July to August, 2016	(for newly recruited members) 1) Project orientation, 2) Team building, 3) Social mobilization, 4) Social mapping and Sensitization meeting	Project Extension Team (G/S, S/M, 5 M/Ts, 10 E/Ws)
	5	August, 2016	Farmer Training (Feeding management I)	Project Extension Team (G/S, S/M, 5 M/Ts, 10 E/Ws)
	6	December, 2016	1) Farmer Training (Animal health, Mastitis, Calf rearing, Marketing), 2) Report writing	Project Extension Team (S/M, 5 M/Ts, 10 E/Ws)
4th	7	February, 2017	1) Practice of Drenching 2) Farmer Training (Calf rearing, Reproduction)	Project Extension Team (S/M, 5 M/Ts, 10 E/Ws)
	8	May, 2017	1) Explanation and practice for new subjects (Livestock management, animal genetics), 2) briefing important points for marketing training	Project Extension Team (S/M, 4 M/Ts, 10 E/Ws)
	9	August to September, 2017	(for newly recruited members) 1) Project orientation, 2) Team building, 3) Social mobilization	Project Extension Team (DPM, 8 female E/Ws)
	10	September, 2017	1) Team building for each district team, 2) SOP, 3) questionnaire of appropriate development checklist	Project Extension Team (5 M/Ts, 10 male E/Ws, 8 female E/Ws)
5th	11	February, 2018	1) Team building, 2) Quiz for technical and extension, 3) review of training materials for farmer training on 8 subjects 4) Practice of question and answers session for farmer training, 5) Report writing (homework)	Project Extension Team (S/M, 4 M/Ts, 9 male E/Ws, 7 female E/Ws)
	12	July, 2018	1) Explanation of baseline survey, 2) Explanation of revised training materials for farmer training, 3) Quiz	Project Extension Team (S/M, 3 M/Ts, 10 male E/Ws, 8 female E/Ws)
	13	December, 2018	1) Team building, 2) Lectures by technical C/Ps, 3) Demonstration of farmer training on 8 subjects by M/Ts, 4) Social mobilization, 5) Demonstration of farmer training by trainees.	District Extension Team (5 V/Os, 10 S/As)
	14	January, 2019	1) Explanation about revised extension guideline and additional SOPs (baseline survey, follow-up and monitoring), 2) Preparation of question guide for follow-up by group work, 3) Practice of question and answer session for farmer training (quiz type), 4) Preparation of activity plan for the absence period of Japanese experts	Project Extension Team (S/M, 4 M/Ts, 10 male E/Ws, 6 female E/Ws)
	15	June, 2019	1) Collection of successful and failed cases, 2) Reflection of each step of the extension activity, 3) Confirmation of the standards of observing animal breeding sites with photos	Project Extension Team (4 M/Ts, 9 male E/Ws, 8 female E/Ws)

	
Extension team	Demonstration of farmer training by trainees

The extension team training comprised a combination of several components such as lectures, group work, practice of facilitation by each district extension team, quiz, and demonstration in the village (social mapping, sensitization meeting, and farmer training).

(6) Extension Activity and Monitoring

The extension activity in the target village was conducted along with the flow of extension activity, as shown in Figure 3-21. Among 25 pilot villages the project suspended the extension activity in one village because the village head never understood the concept of the project's extension activity. Therefore, 24 active pilot villages were included. Further, the project expanded its extension activity to the surrounding villages from the 5th year. Finally, the first group of surrounding villages comprised 15 villages, whereas the second group of surrounding villages comprised 28 villages. The surrounding villages were divided into two groups based on the monitoring process after farmer training.

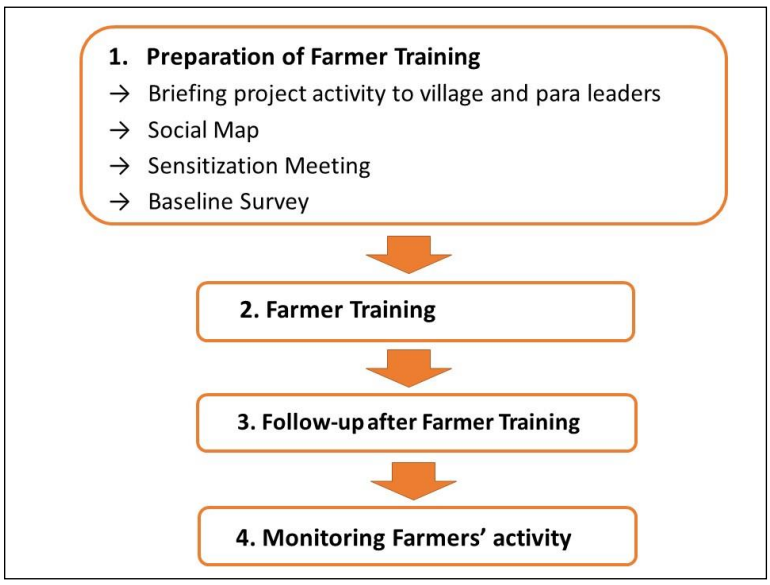


Figure 3-21 Flow of the Extension Activity in the Village

1) Preparation of Farmer Training

As preparation for farmer training, social mapping and sensitization meetings were conducted from

the 2nd year. In the social mapping session, the location of the public place in the village, location of the para[24], and name of surrounding villages was confirmed by the map that participants drew on the floor of the gathering place. For the sensitization meeting, the extension team used materials for explaining and introducing of the project activity on appropriate technology development. After introducing the project activities, the P/F spoke to the participants about his/her working experience with the project and its benefits. The participants then visited the P/F farm to observe the situation. Finally, the names of farmers who willingly attended the farmers' training were confirmed as training registration. These activities were carried out by the temporary extension team (F/P s and S/As, the 2nd year only), extension team, and extension C/P.

In the 4th year, female E/Ws performed as the facilitators, introduced the project activity to female farmers from 22 groups in 19 pilot villages, and called for participation of female farmers in the farmer training.

In the surrounding villages, the project introduced a baseline survey to measure the practice ratio of appropriate technology. The baseline survey was not applicable to the pilot villages because the experiment of appropriate technology had already been developed and disseminated here before the extension activity was started.

	
Social mapping	Sensitization meeting

2) Farmer Training

Farmer training was conducted mainly by the extension team. To reduce the time cost of the farmers, the duration of one session was between 60 min and 90 min maximum. Training sessions were organized into various patterns such as separate gender, gender mixed, separate biradari, and mixed-biradaris. In the 4th year, the farmer training for female farmers was started by female E/Ws.

The farmer training comprised eight subjects: 1) feeding management, 2) livestock management, 3) animal health, 4) mastitis, 5) body measurement and BCS, 6) reproduction and genetics, 7) calf rearing, and 8) marketing.

Every training subject comprised lectures with training materials and an activity that attracted the farmers' interest such as 'seasonal calendar of fodder' for feeding management I training, 'disease scoring' for animal health training, and demonstration of mastitis test with a goat, instead of buffalo, for mastitis training. In case of marketing training, training participants discussed marketing channels among themselves.

[24] A para is an area where several households live together.

	
Marketing Training in a village	Animal Health Training in a village

The achievements of the farmer training (the last update as of December 2019) are shown in Table 3-32. The number of training participants was counted based on the number of participants who attended the training session more than two times.

Table 3-32 Achievements of the Farmer Training

Villages	Times of training sessions				Number of training participants		
	For Male	For Female	Mixed-gender	Total (Times)	Male	Female	Total
Pilot village (24 villages)	196	177	14	387	932	704	1,636
Surrounding villages (43 villages)	326	143	26	495	1,415	508	1,923
Total	522	320	40	882	2,347	1,212	3,559

3) Follow-up after Farmer Training

The extension team should visit villages that have completed farmer training at least once or twice a month. This rule was included in the SOP, which is attached to the extension guidelines. The project also developed a question guide applicable for follow-up activities in collaboration with all the extension team members during the abovementioned extension team training.

4) Monitoring Farmer's Activity using the Appropriate Technology Development Checklist

Farmer activity was monitored through interviews using the appropriate technology development checklist and farm observations from September 2017 to June 2018. The monitoring target was 1,418 farmers (male 904, female 514) who attended the training sessions more than two times from 24 villages for male and 16villages for female farmers who completed the farmer training[25]. The number of interviews conducted was 552 for men and 188 for women. The number of farm observations conducted was 463 for males and 184 for female farmers. The monitoring results were compiled into a monitoring report. The target technology for monitoring was the Rank A technology alone. A high practice ratio was shown in the monitoring results; however, this result is somewhat doubtful when compared with the actual situation on

[25] In the five villages in Badin, female training was not completed by June 2018. Therefore, those five villages of female were excluded from the monitoring targets.

the ground.

To solve the issue of large sample size, which was observed in the first monitoring that targeted the pilot villages, the project reduced the sample size after the second monitoring of pilot villages and the first monitoring of surrounding villages by selecting the target farmers through random sampling from those who had participated in training sessions more than two times. Moreover, the project targeted only those technologies that extension workers could check visually. The target monitoring items included 1) clean water; 2) improved tying methods, 3) simple roof, 4) dry floors, 5) colostrum, 6) heat prevention for calves, 7) BCS, 8) feeding trough cleaning, and 9) hay-making.

The results of the second and third monitoring of pilot villages are shown in Figure 3-22; the results of the first and second monitoring of the first group of surrounding villages are shown in Figure 3-23 and Figure 3-24; and the results of the second group of surrounding villages are shown in Figure 3-25.

Table 3-33 Number of Target Villages and Number of Valid Samples of Monitoring in Pilot Villages

	Period	Male			Female		
		No. of Target villages	No. of valid samples		No. of Target villages	No. of valid samples	
			Farm observations	Interviews		Farm observations	Interviews
First monitoring	September, 2017 to June, 2018	24	463	552	16	184	188
Second monitoring	December, 2019 to January, 2020	24	80	80	20	86	86
Third monitoring	February to March, 2021	24	78	82	20	82	87

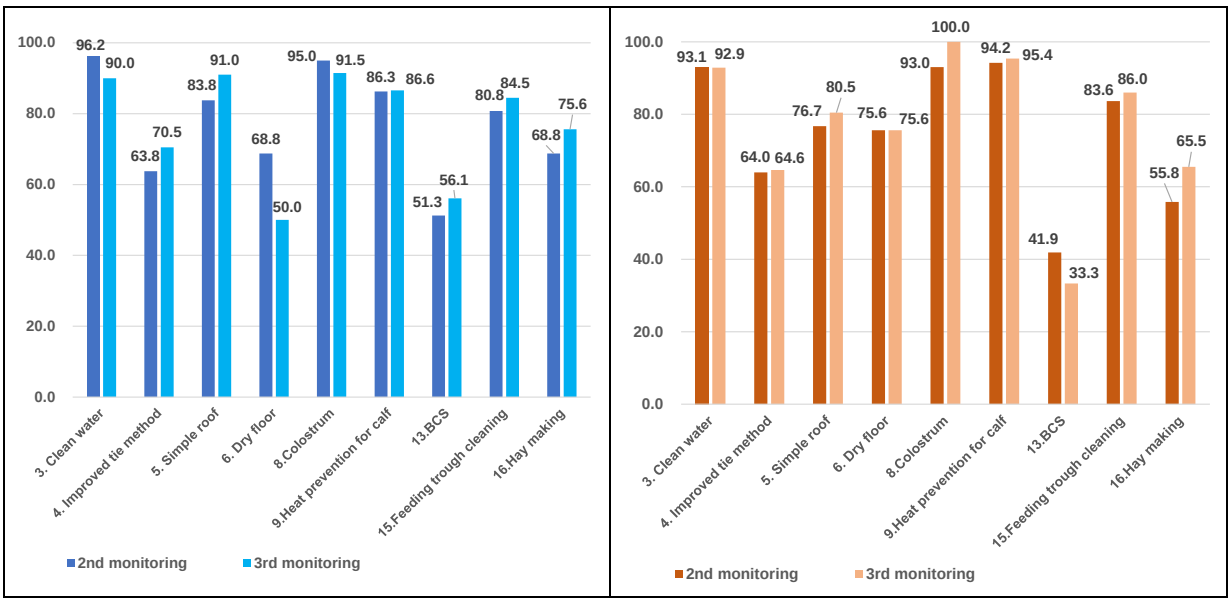


Figure 3-22 Results of the Second and Third Monitoring of Male Farmers (Left) and Female Farmers (Right) in the Pilot Villages

Table 3-34 Number of Target Villages and Number of Valid Samples of Monitoring in the First Group of Surrounding Villages

	Period	Male			Female		
		No. of Target villages	No. of valid samples		No. of Target villages	No. of valid samples	
			Farm observations	Interviews		Farm observations	Interviews
Baseline	July to December, 2018	15	155	205	14	106	175
First monitoring	January to February, 2020	15	79	80	14	80	80
Second monitoring	March to April, 2021	15	83	85	14	79	82

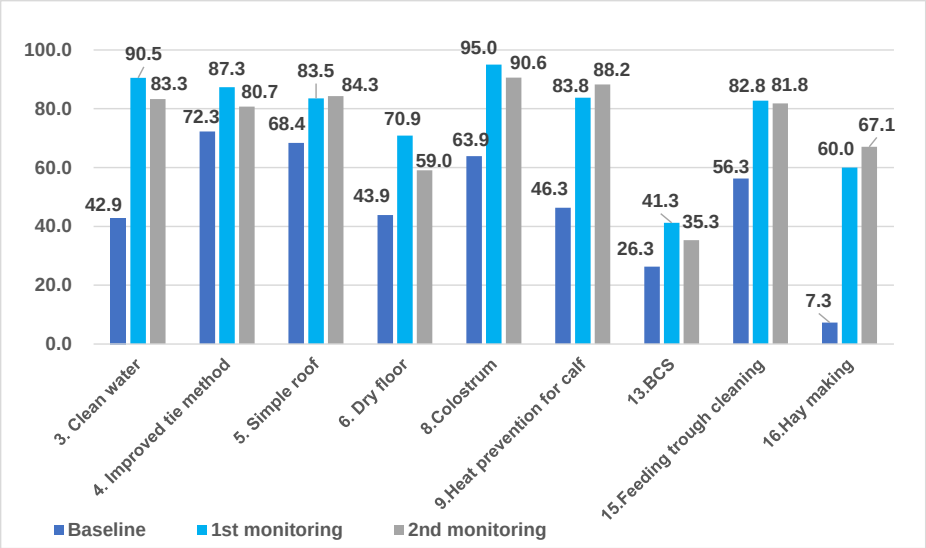


Figure 3-23 Results of the Baseline Survey, the First and Second Monitoring of Male Farmers in the First Group of Surrounding Villages

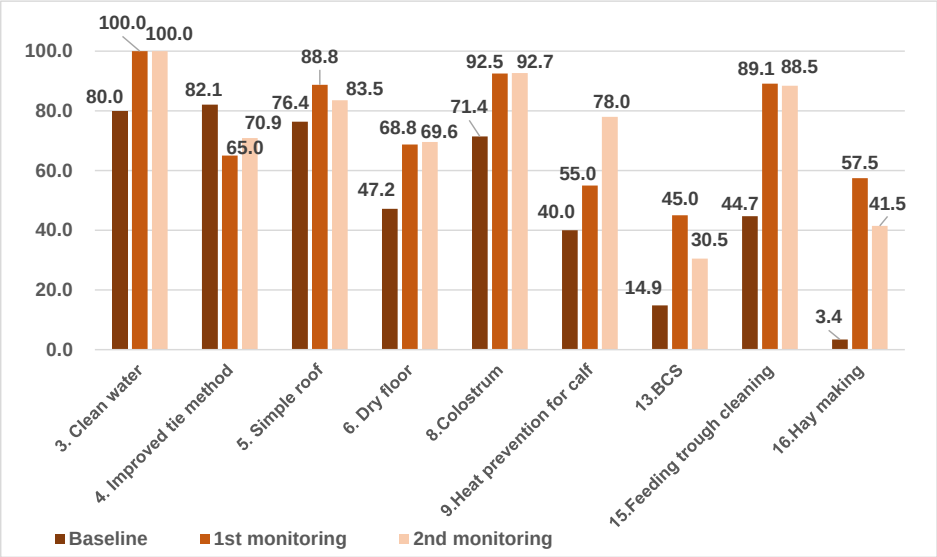


Figure 3-24 Results of the Baseline Survey, the First and Second Monitoring of Female Farmers in the First Group of Surrounding Villages

Table 3-35 Number of Target Villages and Number of Valid Samples of Monitoring in the Second Group of Surrounding Villages

	Period	Male			Female		
		No. of Target villages	No. of valid samples		No. of Target villages	No. of valid samples	
			Farm observations	Interviews		Farm observations	Interviews
Baseline	February to September, 2019	27	331	353	6	75	77
First monitoring	May, 2021	28	85	86			

(Note: After the target number of female farmers was achieved, the farmer training for female farmers in the second group of surrounding villages was stopped. The remaining time and manpower of the extension team members were used for training male farmers, of which the target number had not been achieved at that time.)

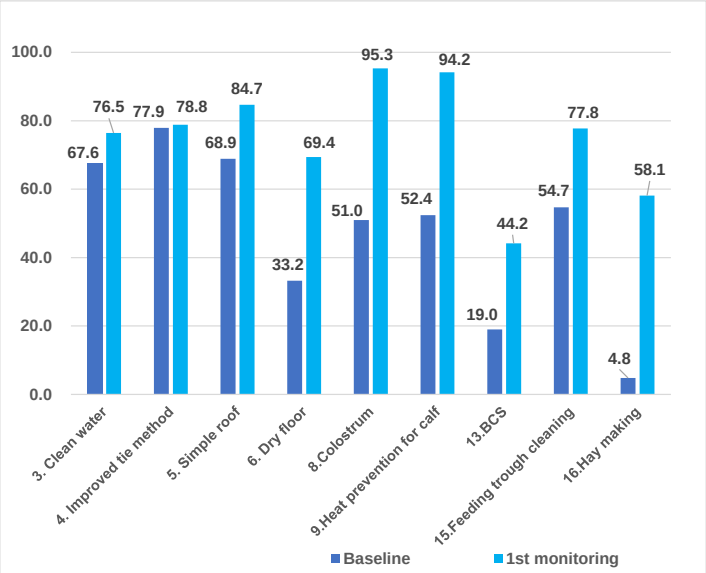


Figure 3-25 Results of the Baseline Survey and First Monitoring of Male Farmers in the Second Group of Surrounding Villages

Objectively Verifiable Indicator 1 is defined as "in the project districts more than 70% of the target group (excluding the pilot farmers) regularly use at least one of the nine "A" rank appropriate technologies within one year after training completion, and more than 50% even after more than one year". However, it was found that more than 50% of the target group continued to regularly use at least one of the same nine "A" rank appropriate technologies even after more than one year of training completion.

The simple average of practice ratio (%) for nine appropriate technologies in the third monitoring of the pilot villages, the second monitoring of the first group of surrounding villages, the first monitoring for the second group of surrounding villages was higher than 50%, despite the time of more than one year from training completion. The details are shown in Table 3-36.

Table 3-36 Simple Average of Practice Ratio (%) for Nine Appropriate Technologies

Category	Simple Average of Practice Ratio (%)	
	Male farmer	Female farmer
Pilot village (the third monitoring)	77.3	77.1
Surrounding village, the first group (the second monitoring)	74.5	72.8
Surrounding village, the second group (the first monitoring)	75.5	N/A

One reason for the high practice ratio is that the A-rank technology is easy to practice for farmers. According to the extension team, they continued to visit the farmers after completion of training, apart from monitoring. This helped farmers retain their interest in appropriate technologies. Among the target technologies for monitoring, No.5 (colostrum), No.7 (BCS), and No.9 (Hay making) were newly introduced to the farmers by the project. The practice ratio of these technologies was drastically increased in the second group of surrounding villages. The second group of surrounding villages had already obtained some information from the first group of surrounding villages and their willingness and interest to join the farmer

training was high before the project activity was started. This could be related to an increase in the practice ratio.

(7) Selection of Core Farmers and Core Farmer Training

Among 72 candidates in the 24 pilot villages, 19 core farmers were selected between April 2018 and the beginning of May 2019. The selection criteria of the core farmers were as follows: i) times of attendance in the farmer training sessions, ii) practice of appropriate technologies (visual inspection by the extension team), and iii) personality. Three to four candidate core farmers were shortlisted for each village based on i) and ii). To confirm iii), interviews with candidate farmers and farm observations were conducted. This process was reported in the Report on the Selection of Core Farmers.

According to the interview results, every farmer disseminated information to others to some extent. In the narrow range, the core farmer disseminated information to relatives and friends. In a broad range, the core farmer disseminated information to multiple surrounding villages. In addition, the farmers of the surrounding villages visited the core farmers to obtain information.

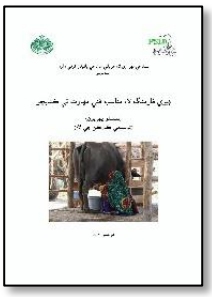
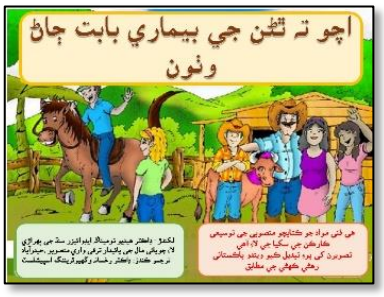
The core farmer training started in January 2019, and all 19 core farmers completed the training. The training cost was disbursed from the PC-I budget.

According to the monitoring survey in 2021, 14 core farmers out of 19 had continued to disseminate information to the surrounding villages and others to some extent, e.g., i) the core farmer disseminated information to the other farmers in the village/other villages when they met for agricultural work in the field or at social gatherings; ii) when a certain delegation came to the village, the core farmer appealed about the project activity to the delegation members, and iii) the core farmer utilized the 'Basic information for the core farmers'.

	
A scene of core farmer training (TMK District)	Demonstration of heart girth measurement of a calf

(8) Development of Extension Materials

The extension materials developed were as follows: i) Textbook for Appropriate Technology of Dairy Farming for Extension Team (English and Sindhi), ii) Teaching Guide for Extension Team, iii) Materials for Teaching the Farmers (English and Sindhi), iv) Handbook for Extension Team, v) Basic Information for the Core Farmers (English and Sindhi); vi) Animal Health Calendar; and vii) Comic for Mastitis Learning (English and Sindhi).

	
Textbook for Appropriate Technology of Dairy Farming for Extension Team (Sindhi)	Comic for Mastitis Learning (Sindhi)

(9) Development of Extension Guidelines

The extension guidelines comprise extension-related information such as an extension plan based on the results of the PRA survey, principles, structure, details of the activity, and procedures. The SOP for extension activity also included i) training material development; ii) social mapping; iii) sensitization meeting; iv) baseline survey; v) farmer training; vi) follow-up; vii) monitoring; and viii) car management. In addition, a model activity schedule and reporting system were also included. The guidelines were finalized in the 5th year.

3.6.2 Products

Table 3-37 lists technical cooperation products for Output 3.

Table 3-37 List of the Technical Products of the Project

Type	Title	Submission Year	Contents	Appendix No.
Farmers' Current Situation Survey	Monitoring Report on Application of Appropriate Technology by Farmers (Part1)	5th year	Survey result on the practice ratio (%) of A rank technologies by farmers in 24 pilot villages from five districts	T3-1
	Monitoring Report on Application of Appropriate Technology by Farmers (Part2)	5th year	Survey result on the practice ratio (%) of A rank technologies by farmers in 24 pilot villages and 43 surrounding villages from five districts	T3-2
	Report on Selection of the Core Farmers	5th year	Process of core farmer selection	T3-3
Extension Guideline	Extension Guideline	5th year	Extension plan based on the results of the PRA survey, extension activity details, flows, and SOP	T3-4
Extension Material	Textbook for Appropriate Technology of Dairy Farming for Extension Team (English Version)	5th year	A-rank appropriate technologies developed by the project	T3-5
	Textbook for Appropriate Technology of Dairy Farming for Extension Team (Sindhi Version)	5th year	Local language version of the above textbook	T3-6
	Teaching Guide for Extension Team	5th year	Explanation of implementation methods for the extension activity	T3-7
	Materials for Teaching the Farmers (English Version)	5th year	Lists and explanation of farmer training materials for eight subjects	T3-8
	Materials for Teaching the Farmers (Sindhi Version)	5th year	Local language version of the above material	T3-9

Type	Title	Submission Year	Contents	Appendix No.
	Handbook for Extension Team	5th year	Reference for the extension team, such as list of contact numbers for veterinary services, list of terminology for dairy farming in English and Sindhi	T3-10
	Basic Information for the Core Farmers (English Version)	5th year	Key messages and basic information for the core farmers, extracted from the training materials for farmer training	T3-11
	Basic Information for the Core Farmers (Sindhi Version)	5th year	Local language version of the above information	T3-12
	Animal Health Calendar	5th year	Suitable timing of vaccination and deworming	T3-13
	Comic for Mastitis Learning (English Version)	2nd year	Detailed descriptions of mastitis in a comic form	T3-14
	Comic for Mastitis Learning (Sindhi Version)	2nd year	Local language version of the above comic	T3-15

Table 3-38 lists other products for Output 3.

Table 3-38 List of the Other Products of the Project

Title	Submission Year	Contents	Appendix No.
PRA Survey Report	1st year	The results of the PRA survey for male farmers in four villages selected among the pilot villages	Z3-1
PRA Survey Report (Second)	2nd year	1) Results of the PRA survey for male farmers in five newly selected villages among the pilot villages 2) Results of the PRA survey for female farmers in a total nine villages (same villages as male farmers' survey)	Z3-2
Report on the Past Extension-Related Experience	1st year	Results of interviews with extension-related organizations regarding their extension activity on livestock production and dairy farming	Z3-3
Report on the Extension Team Training	2nd year	The 1st training for the tentative extension team: Orientation	Z3-4
		The 2nd training for the tentative extension team: how to organize social mapping	Z3-5
	3rd year	The 3rd training for the tentative extension team: how to organize sensitization meetings	Z3-6
		The 4th training for newly recruited C/Ps, M/Ts, and male E/Ws: Orientation	Z3-7
		The 5th training for M/Ts and male E/Ws: Demonstration of farmer training (feeding management) etc.	Z3-8
		The 6th training for M/Ts and male E/Ws: Demonstration of farmer training (animal health, mastitis, calf rearing, and marketing) etc.	Z3-9
	4th year	The 7th training for M/Ts and male E/Ws: Demonstration of farmer training (calf rearing and reproduction), review of animal health	Z3-10
		The 8th training for M/Ts and male E/Ws: Demonstration of farmer training (livestock management and genetics), review of marketing	Z3-11
		The 9th training for a M/T and female E/Ws: Orientation	Z3-12
		The 10th training for all extension staff: Team building for each district extension team	Z3-13
	5th year	The 11th training for the project extension team: Practice of question-and-answer session for farmer training etc.	Z3-14
		The 12th training for the project extension team: Review of materials for farmer training, etc.	Z3-15

Title	Submission Year	Contents	Appendix No.
		The 13th training for the Department extension team: Orientation	Z3-16
		The 14th training for the project extension team: explanation on revised SOPs and preparation of question guide for follow-up, etc.	Z3-17
		15th training for the project extension team: Collection of successful cases and failure cases, reflection of each step of extension activity, and confirmation of the standards in observing animal breeding sites with photos	Z3-18

3.6.3 Levels of Achievement of Indicator

Objectively verifiable indicators in PDM Ver. 4 are shown below. The levels of Achievement for the Output 3 Target as of the end of June 2021 are shown in Table 3-39.

Narrative Summary	Objectively Verifiable Indicators
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts with gender consideration	3-1. The counterparts, master trainers, and extension workers have a capacity to instruct farmers according to the extension plans and materials prepared by the Project. 3-2. Appropriate technologies are disseminated to about 3,000 (2,000 male and 1,000 female) farmers. 3-3. Effective methods for farmer-to-farmer dissemination of technologies are demonstrated

Table 3-39 Levels of Achievement of Indicators

Indicator No.	Levels of Achievement
3-1	The level of understanding about the training contents of the extension team members were measured through the extension team training by several activities such as practice of question and answers for the farmers, quiz, and report writing. It was confirmed that each extension member had the necessary knowledge to conduct the farmer training. Therefore, this indicator was achieved.
3-2	In the pilot and surrounding villages, the total number of participants that attended the training session more than two times was 3,559 (Male 2,347, Female 1,212). This achievement was much greater than the target number of 3,000 (Male 2,000, Female 1,000).
3-3	Regarding the farmer-to-farmer extension, the project expected that information would be disseminated from a core farmer to other farmers. In all, 19 core farmers were selected in the pilot villages. The core farmer training was completed. Fourteen core farmers out of 19 continued to disseminate information to the surrounding villages and others as of May 2021.

3.6.4 Project Sustainability after Project Completion

Establishment of the Extension Directorate in the Livestock Department is essential to continue the full scale of extension activity that the project conducted for disseminating the appropriate technologies. Fortunately, the extension team leader passed the examination to be recruited as a permanent government officer. Therefore, experience of the extension activity in the project and how to use the training materials could be extended through the extension team leader in the Department. It is most desirable that other

extension team members are also employed as permanent government officers when the extension directorate is established.

However, it is expected that a long time will be needed until the extension directorate is established in the Department. Therefore, some countermeasures are required to retain the extension members' knowledge and experience through the project. For the Department, it is recommended that they utilize the extension team members for similar activities. If it is difficult to have such opportunities, each extension member needs to find a livestock-related job in other organizations to gain experience and enhance their own ability. As a countermeasure, the project proposed that the extension team members form a self-learning group using a smartphone application for communication.

3.7 Output 4: Activities, Products, and Levels of Achievement

3.7.1 Activities

(1) Baseline Survey (Training Needs Assessment)

The project team suggested 11 project management training courses to the Livestock Department, as necessary for the Department's institutional and management capacity building based on the lessons learned in the M/P Study. Table 3-40 lists these courses. After obtaining the Department's consensus, in May 2014, the project team conducted a training needs assessment (TNA) survey to determine the Department officers' needs for these training courses.

The TNA targeted 51 officers from all directorates of the Department. The results showed that most officers answered that all 11 courses were either "very important" or "important." Many officers considered that the courses on project management topics such as "strategic planning of project" and "project monitoring & evaluation" were "very important," whereas they considered the courses on farmer-related topics such as "social mobilization," "gender consideration," "farmers organization" and "entrepreneurship development" were simply "important" or "less important."

(2) Training Institute Selection

Based on the above assessment results, the project team developed the TOR for 11 training courses and started the process of selecting a sub-contracted training institute. First, the project team shortlisted four training institutes after discussions with the Department based on their previous training records and reputation. Second, the project team requested the four training institutes to submit their technical and financial proposals. The project team then evaluated these proposals based on the levels of understanding of the training courses and the quality of the training plan, and selected the Institute of Rural Management (IRM), which obtained the highest evaluation score, as the sub-contracted institute.

(3) Pilot Training (1st Year)

In the 1st year, the 11 training courses listed in Table 3-40 were conducted, of which nine were conducted by the IRM and two were conducted in collaboration with JICA's Non-Formal Education Promotion Project (NFEPP). The 1st year of training was a pilot case that aimed to measure the levels of the Department officers' understanding and interests and to reflect the lessons learned in the 2nd year training plan. The training period of each course was intended to be short, with only one to three days. The expected

number of participants was approximately 20. The concerned directorate of the Department recommended the names of the training participants.

Table 3-40 Overview of 1st Year Training Courses

#	Theme	Training institute	Period
1	Social mobilization	IRM	October 22-24
2	Strategic planning of the project	IRM	October 27-29
3	Communication	IRM	October 30-31
4	Conflict resolution	IRM	November 5
5	Monitoring & Evaluation	IRM	November 6-7
6	Gender	NFEPP	November 11
7	Farmers organization	NFEPP	November 12-14
8	Leadership	IRM	November 17-18
9	Decision-making	IRM	November 19
10	Reporting	IRM	November 20-21
11	Entrepreneurship	IRM	November 24-26

Certificates were given to the training participants according to requests from the Department and IRM. For this, pre-tests and post-tests were conducted at the beginning and the end of the courses with more than two days, respectively, to measure the levels of improvement in the training participants' understanding, using the same test. Participants who scored more than 70% in the post-test received a certificate of completion, whereas the others received a certificate of attendance.

The 1st year training course was conducted for 23 days and 75 officers participated in total. Table 3-41 summarizes the results of the pre- and post-tests. These results are reflected in the 2nd year training plan.

Table 3-41 Results of Pre-Test and Post-Test (1st Year)

Theme	No. of Participants	No. of Participants with Completion	Pre-Test Average Score (%)	Post-Test Average Score (%)
Social mobilization	19	11	41	67
Strategic planning of project	20	5	3	21
Communication skills	21	14	12	66
Conflict resolution	20		No pre- or post-tests	
Project monitoring & evaluation	21	19	36	83
Gender	22		No pre- or post-tests	
Farmers organization	21	19	30	74
Leadership	17	14	18	72
Decision making	17		No pre- or post-tests	
Reporting	16	11	16	68
Entrepreneurship development	19	9	26	66

(4) Training (2nd Year)

1) Review

After completing the pilot training course in the 1st year, the project team reviewed the current situations and issues of human resource development in the Livestock Department, which were revealed by the M/P Study, to plan the 2nd year training courses. The following is a summary of the M/P study findings.

Current situations and issues of human resource development in the Livestock Department (M/P study findings)
・ There is a very limited number of training opportunities for Livestock Department officers particularly in non-technical (management) subjects ・ This results in the fact that the Livestock Department officers have little concern and knowledge for project management. For example: 1) Every year, the project proposals (PC-I) are prepared by the Directors of each Directorate. However, because the Department does not have any guideline policy or strategy, PC-Is are prepared in an arbitrary manner. There is no consistency between the PC-Is of different Directorates. 2) There is no effective project monitoring and evaluation system, and thus no lessons are learnt. 3) There exists a directorate in charge of monitoring and evaluation, but it is not functional. There is no reporting system. 4) There is no human resource development plan or recruitment plan, and thus appropriate persons are not assigned to appropriate positions.

The project team reviewed the 1st year TNA results and training results with the Department, and discussed the above issues. As a result, the following training policy was agreed upon:

・ Participants from the Livestock Department provided positive comments for almost all courses. Therefore, the Livestock Department would like to welcome this kind of non-technical (project management) training.

・ The project team and the Department officers who participated in the reviewing session reached a consensus that the 2nd year plan should be developed based on the policy below.

1) This kind of training should be continued even after the 2nd year. 2) Training should become an opportunity for participants to take any action after training. 3) Participants should be selected more carefully. 4) Training topics should reflect the actual needs of the Department more precisely.

2) Establishment of Taskforces

The project team suggested the establishment of two taskforces: (1) Project Management Taskforce (PMTF) for improving the Department's project management skills and (2) Extension Taskforce (TF) to establish an extension structure within the Department. This suggestion was based on the intension that TF members should initiate the internal reform of the Department and utilize training opportunities to take the necessary actions. The Department key officers agreed to this and decided to establish the two TFs by

selecting members from each Directorate. After going through discussions and activities with the two TF members, only the PMTF was continued, which would later become the CBU.

3) 2nd Year Training Policy

After going through the above process, the project team classified the major issues of the Livestock Department into the following four aspects.

1) Project planning and monitoring methods (necessary steps for project planning and monitoring, basics of project cycle management)
2) Planning and monitoring structure in the Department (including strengthening and reorganizing the Directorate of Planning and Monitoring)
3) Annual project planning process (preparation, assessment, and approval of project proposals in the Department, how to design PC-I, timely allocation of project funds)
4) Human resource development and management

Therefore, the project team decided to cover these topics in the 2nd year training courses. Further, two of the project indicators were targeted: (1) building the capacity to develop planning, monitoring, and evaluation reports; and (2) developing draft SOPs.

4) Training

Under the above policy, the 2nd year of management training was conducted for 29 days between October and December 2015. The five training courses in Table 3-42 were conducted by the same sub-contracted training institute, IRM, from the 1st year.

Table 3-42 Overview of the 2nd Year Training Courses

Theme	Training Period	No. of Participants
Participatory planning, monitoring, and evaluation of the projects	October 26 to November 3 (7 days)	15
Report writing skills	November 9 to 13 (5 days)	12
Project proposal (PC-I) writing	November 25 to December 3 (7 days)	13
Human resource management and development	December 7 to 11 (5 days)	9
Developing SOPs for the Department	December 14 to 18 (5 days)	9

The project first received nomination lists of candidate participants from each directorate and then finalized the participants. Therefore, the target of 20 participants was not achieved for all courses. The results of the pre -and post-tests are shown in Table 3-43. The feedback results are shown in Table 3-44.

Table 3-43 Results of Pre-Tests and Post-Tests (2nd Year)

Theme	Number of Participants	Number of Participants with Completion	Average Scores of Pre-Tests (%)	Average Score of Post-Tests (%)
Participatory Planning, Monitoring and Evaluation of the projects	15	12	38	75
Report Writing Skills	12	9	35	72
Project Proposal (PC-I) Writing	13	7	23	63
Human Resource Management and Development	9	0	6	46
Developing SOPs for the Department	9	8	12	81

Table 3-44 Results of Feedback from Participants (2nd Year)

Theme	Very Satisfied	Satisfied	Not Very Satisfied	Dissatisfied
Participatory Planning, Monitoring and Evaluation of the projects	5 (33%)	10 (67%)	0 (0%)	0 (0%)
Report Writing Skills	4 (33%)	7 (58%)	1 (8%)	0 (0%)
Project Proposal (PC-I) Writing	9 (69%)	4 (31%)	0 (0%)	0 (0%)
Human Resource Management and Development	7 (78%)	2 (22%)	0 (0%)	0 (0%)
Developing SOPs for the Department	7 (78%)	2 (22%)	0 (0%)	0 (0%)

Participants are having a group presentation

Participants are making a project gantt chart

On December 16, 2015, the project team invited all participants from the 2nd year of training to collect their feedback and discuss their assignments for converting their lessons into actions.

On January 20, 2016, the closing ceremony was held with the participation of the new Secretary Livestock. During the ceremony, certificates were distributed to the participants, and feedback was obtained from the participants and key officers regarding the 2nd year of training. On January 21, a consultation meeting with key officers and a meeting with PMTF members was held. The project team explained the 3rd

year training implementation policy, discussed the feedback obtained in the closing ceremony, and exchanged opinions with the meeting participants. The project team also gave PMTF members some assignments to be discussed among the members before the 1st meeting in the 3rd year

(5) Training (3rd Year)

1) 3rd Year Training Policy

Based on previous experience, integrating the project activities into the Livestock Department's usual activities was considered essential to enhance project sustainability. For this, the project expanded its targets to the Department's usual activities and the officers in charge of these activities. The project also added new targets indicators regarding "establishment of a reporting structure within the Department," "SOP development" and "M/T development" to the original Output 4 indictors on the PDM. Table 3-45 summarizes the annual targets for the 3rd year and the subsequent years.

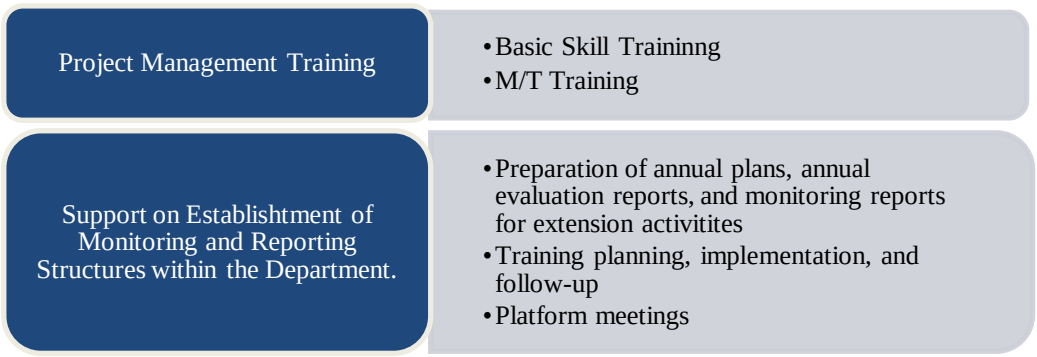
Table 3-45 Annual Targets (3rd Year)

Year	Establishment of Reporting Structure within the Department	SOP Development	M/T Development
The 3rd year (2016/17)	**For JICA Project** - Reporting formats were ready - Writing skill was strengthened - Responsible officers were determined - The proposed reporting structure became operational **For the Department** - The proposed reporting structure was introduced to several projects in the Department	**For JICA Project** - The first draft of the SOP was developed for some of the project activities	**For JICA Project** - Project management training was on-going under several themes - M/Ts for some subjects were developed by the training.
The 4th year (2017/18)	**For JICA Project** - Monitoring reports were regularly submitted - Evaluation report and planning report were prepared by the project team and the Department **For the Department** - Reporting structure became operational for some projects in the Department	**For JICA Project** - The second draft of the SOP was developed for most of the project activities	**For the JICA Project** - Project management training was on-going under several themes **For the Department** - M/Ts began providing training to the officers in the Department
The 5th year (2018/19)	**For the JICA Project** - Monitoring reports were regularly submitted - Evaluation report and planning report were prepared by the Department **For the Department** - Reporting structure became operational for some projects in the Department	**For the JICA Project** - The final SOP was developed for all project activities - The project activities were ready to be carried out by the Department using the SOP	**For the JICA Project** - Project management training was on-going under several themes **For the Department** - M/Ts continued to provide training to the officers in the Department

2) 3rd Year Activities

Based on the above policy, the project team divided the Output 4 activities into "Project Management Training" and "support on the Department's actions through discussion for establishment of a new structure". Training was further divided into "basic skill training" for equipping Department officers with basic knowledge necessary for project management, and "M/T training" to develop future trainers.

The new structure was intended to contribute toward achievement of the Output 4 indicators and enhancement of project sustainability by connection with the necessary actions for institutional development. More specifically, the team aimed to provide the necessary support for building the Department's capacity in i) preparing annual plans and annual evaluation reports, and monitoring reports for extension activities; ii) planning, implementing, and follow-up training; and iii) organizing platform meetings.



3) Training

The project team discussed the CBU and finalized the training themes according to the CBU's proposal, as shown in Table 3-46. It was also agreed to rank the M/T training participants from A to C based on their performance during the training sessions and to certify the A rank officers as M/Ts. The 3rd year training course continued for six months from August 2016 to January 2017 and was conducted by the IRM.

Table 3-46 Overview of the 3rd Year Training Courses

Type of Training	Theme	Period	No. of Participants
Basic Skill Training	Pre-Test	July 25 and August 2 (2 times)	110
	Project Cycle Management	August 8 to 12 (5 days)	20
	PC-I Writing	August 22 to 26 (5 days)	20
	Monitoring and Reporting	October 17 to 22 (6 days)	22
	SOP Development	November 14 to 18 (5 days)	15
M/T Training	Pre-Test	September 5	59
	M/T for Project Management	November 28 to December 2 (5 days of lecture) December 8 (1 day of field practice)	17
	M/T for Social Mobilization	January 16 to 20 (5 days of lecture) January 24 (1 day of field practice)	19

Type of Training	Theme	Period	No. of Participants
Next Action W/S	Project Cycle Management	December 7 and January 12 (2 times)	13
	PC-I Writing	December 12 and January 12 (2 times)	9
Closing Ceremony	-	January 26	-

From the 3rd year, to maintain the quality of training sessions, a "pre-test" system was introduced, through which only motivated and competent officers would be selected to participate in the training sessions based on their written exam and interview results. Further, assignments (called "Next Actions") were given to the participants after the training sessions so that they could utilize lessons from the training sessions, the progress of which was followed up by the CBU as mentioned below. After completion of all the courses, the closing ceremony was held in January 2017, inviting all the participants for the distribution of certificates of completion or attendance, depending on their post-test results and to discuss the lessons and suggestions for the next year of training.

Pre-Test: Written exam for Department officers

Pre-Test: Interview (CBU member, IRM resource person, CBU member from left to right)

Project Cycle management: Participants are presenting a part of the PDM that they developed

Project Cycle Management: Training in progress

The results of the pre-tests and post-tests, M/T training, and feedback from the participants are shown in Tables 3-47 to 3-49.

Table 3-47 Results of Pre-Tests and Post-Tests (3rd Year)

Theme	No. of Participants	Avg. Score (Pre-Test)	Avg. Score (Post-Test)	No. of Participants with Completion (Passing Marks 60)
Project Cycle Management	20	19	62	10 (50%)
PC-I Writing	20	24	75	19 (95%)
Monitoring and Reporting	22	36	72	18 (82%)
SOP Development	15	9	64	12 (80%)
M/T for Project Management	16*	45	59	5 (31%)
M/T for Social Mobilization	19	14	54	6 (32%)

* One participant out of 17 did not take the tests.

Table 3-48 Results of M/T Training (3rd Year)

Theme	No. of Participants	No. of A Rank*	No. of B Rank	No. of C Rank
M/T for Project Management	17	6 (35%)	5 (29%)	6 (35%)
M/T for Social Mobilization	19	9 (47%)	7 (37%)	3 (16%)

*The number of A rank officers was later increased to 10 as a result of another training course.

Table 3-49 Results of Feedback from Participants (3rd Year)

Theme	No. of Participants	Greatly Satisfied	Satisfied	Not Very Satisfied	Not at All Satisfied
Project Cycle Management	20	12 (60%)	7 (35%)	0 (0%)	1 (5%)
PC-I Writing	20	17 (85%)	3 (15%)	0 (0%)	0 (0%)
Monitoring and Reporting	22	17 (77%)	5 (23%)	0 (0%)	0 (0%)
SOP Development	14*	11 (79%)	3 (21%)	0 (0%)	0 (0%)
M/T for Project Management	13**	5 (38%)	8 (62%)	0 (0%)	0 (0%)
M/T for Social Mobilization	19	10 (53%)	7 (37%)	0 (0%)	2 (11%)

* One participant out of 15 did not answer the questionnaire. **Four participants out of 17 did not answer the questionnaire.

4) CBU

The PMTF, which was established in the 2nd year, was newly re-organized as the CBU, which worked on the training needs assessment, suggestion of training themes, selection of training participants, coordination among the stakeholders, logistic arrangement for implementation, and follow-up after the training courses. The project agreed with the Department to strengthen the CBU as a permanent unit that would continue to work for capacity building of the Department.

In the 3rd year, two PMTF meetings and four CBU meetings were held to discuss the implementation structure of project management training, the roles of the CBU, the training implementation

policy, the training preparation and implementation schedule, and the capacity building of CBU members.

(6) Training (4th Year)

1) Training

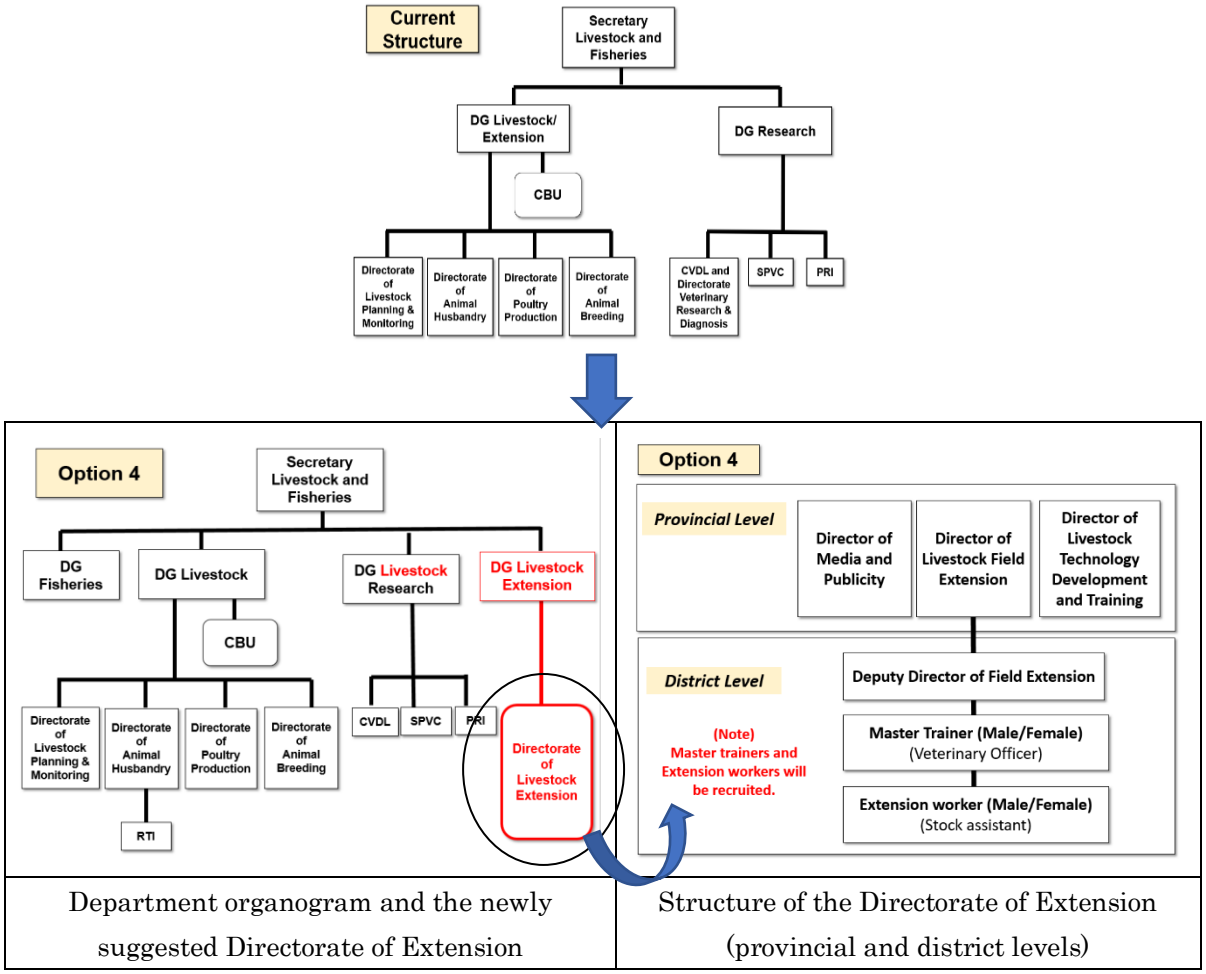
The IRM was sub-contracted to conduct six training courses for the 4th year project management training, as shown in Table 3-50. The first four courses were categorized as "basic skill training" to improve the basic project management capacity of the Department staff. The training themes were suggested by the CBU, which had conducted the needs assessment, and finalized jointly by the CBU, P/M, and Japanese experts. The last two training courses were categorized as "project sustainability improvement training" and were provided in a W/S style.

Table 3-50 Overview of the 4th Year Training Courses

Theme	Date (Period)	No. of Participants
Pre-Test	August 3	163
Basic Skill Training		
(1) Report Writing	September 11 to 15 (5 days)	23
(2) PC-I Writing	September 18 to 22 (5 days)	17
(3) Communication and Leadership	September 25 to 29 (5 days)	19
(4) SOP Development	October 9 to 13 (5 days)	22
Sustainability Improvement Training		
(5) Establishment of Extension Structure	August 9 (Pre W/S) November 20 to 24 (5 days)	19
(6) Human Resource Development Strategy	May 23 (Pre-W/S) September 20 to 21 (2 days) October 16 to 18 (3 days)	25
Closing Ceremony	January 25, 2018	-

2) Establishment of the Extension Structure Course

In this course, participants discussed the best Department extension structure for the future so that the current extension activity could continue even after the project period. The participants discussed the advantages and challenges of several options. On the last day of the course, Department key officers also participated in the session and agreed on the structure shown in Figure 3-26. This structure was explained and suggested to the Secretary Livestock and Department key officers in the 6th S/C and on other occasions. The "Restructuring Committee" was later established at the Department. This committee discussed and suggested ideas based on this structure.



Department organogram and the newly suggested Directorate of Extension

Structure of the Directorate of Extension (provincial and district levels)

Figure 3-26 Suggested Extension Structure

The results of the 4th year pre-tests and post-tests and the feedback from participants are shown in Tables 3-51 and 3-52. In the 4th year, 78 (63%) of 123 participants were certified to have completed the training courses. Of these, 112 participants (92%) answered that they had been either "very satisfied" or "satisfied," indicating the same high satisfaction levels as the previous years.

Table 3-51 Results of Pre-Tests and Post-Tests (4th Year)

Theme	No. of participants	Average Score (Pre-Exam)	Average Score (Post-Exam)	No. of Participants with Completion*
Report Writing	23	22	75	22 (96%)
PC-I Writing	16**	9	64	11 (69%)
Communication and Leadership	18**	14	46	3 (11%)
SOP Development	22	9	52	7 (32%)
Establishment of Extension Structure	19	-	-	19 (100%)***
Human Resource Development Strategy	25	-	-	16 (76%) ***
Total	123	-	-	78 (63%)

* Passing marks were 60. ** 1 out of 17 or 19 participants did not take the exam. *** There were no pre- and post-tests because the themes were very specific. Instead, those who attended the complete 5-day training were certified to have completed the course, whereas the others were certified to have attended the course.

Table 3-52 Results of Feedback from Participants (4th Year)

Theme	No. of Answers	Very Satisfied	Satisfied	Not Very Satisfied	Not Satisfied
Report Writing	22	14 (64%)	7 (32%)	0 (0%)	1 (5%)
PC-I Writing	16	14 (88%)	2 (13%)	0 (0%)	0 (0%)
Communication and Leadership	19	10 (53%)	9 (47%)	0 (0%)	0 (0%)
SOP Development	22	15 (68%)	5 (23%)	1 (5%)	1 (5%)
Establishment of Extension Structure	19	11 (58%)	8 (42%)	0 (0%)	0 (0%)
Human Resource Development Strategy	22*	13 (59%)	4 (18%)	5 (23%)	0 (0%)
Total	122	77 (63%)	35 (29%)	6 (5%)	2 (2%)

* Three of 25 participants did not answer the evaluation sheet.

Lecture scene from the Report Writing Course

Participants are developing SOPs

3) CBU

The new CBU was established with a new full-time chairperson (Dr. Rukhsana Vighio, ex- Training C/P) and 10 new part-time members in May 2017. In August, an office was opened in the same building where the project office was located. The CBU held weekly or biweekly regular meetings to manage the progress of the activities. The CBU also collected the personal pro forma of Department officers to develop the Department's human resource database, which would be useful when planning or coordinating future training events.

(7) Training (5th Year)

1) Training (Before January 2019)

Eight training courses were planned in the 5th year. However, only the three courses shown in Table 3-53 were conducted. All three courses aimed to improve sustainability.

Table 3-53 Overview of the 5th Year Training Courses (Before January 2019)

Theme	Period	No. of Participants
CBU Team Building	May 15 to 17, 2018 (3 days)	8
Capacity Building Strategy (CBS) Development	May 21, 2018 (1 day)	17
SOP Development 1 (CBU)	October 15 to 19, 2018 (5 days)	9

CBS development course

The project conducted several W/Ss and training courses continuously from the 4th year as a follow-up of suggestions from the MTR Mission in the 3rd year to develop the CBS, for improving the capacity of the Livestock Department officers. The said course in Table 3-53 was the last W/S of the whole process, in which the CBS draft action plan for implementing the strategy was finalized. The CBS analyzed the current situation of the Department's human resource development and the training needs of the officers. The CBS included the following strategic goals as well as short-term, mid-term, and long-term action plans for each of these three goals and assigned the CBU to the implementation body.

CBS Strategic Goals

1) To boost the performances of V/Os and S/As by enhancing their managerial and technical skills for contributing sustainable and qualified livestock services 2) To develop a system of research and learning, including the development and adoption of appropriate modern technologies and best practices of V/Os and S/As for livestock services and development 3) To strengthen the Capacity Building Unit for improved coordination and need-based capacity development initiatives

SOP development (CBU) course

In this course, the CBU members prepared the SOP document that would regulate the training implementation procedures, which they had gone through together with the Japanese experts, aiming to help them plan and manage the training courses independently after the project completion.

The finalized SOP document was handed over to the Department at the 10th S/C meeting together with the other four SOP documents developed so far (technical training, 90 days calf salvation, few days calf salvation, and extension activity). The Department is expected to utilize these SOPs for continuing the project activities sustainably.

2) Training (After February 2019)

The training courses shown in Table 3-54 were conducted. The original schedule was to complete all the courses by June 2020, but several later courses were postponed from April to June 2021 because of the ban on social gatherings for preventing COVID-19 spread.

Table 3-54 Overview of the 5th Year Training Courses (After February 2019)

	Theme	Date	No. of Participants
Basic Skill Training	Pre-Test for Participants Selection	May 2, 2019 (1 day)	117
	Project Management (delivered by M/Ts)	July 24- 26, 2019 (3 days)	20
	Social Mobilization (delivered by M/Ts)	July 24-26, 2019 (3 days)	18
	Pre-Test for Participants Selection	February15, 2020 (1 day)	31
	Communication Skills with Livestock Farmers	March 4-8, 2020 (5 days)	20
	SOP#6 Development (P/M)	April 6-10, 2021 (4 days)	23
	Pre-Test for Participants Selection	June 15, 2021 (1 day)	25
	Communication Skills with Livestock Farmers (delivered by M/Ts)	June 23-25, 2021 (3 days)	20
Sustainability Improvement Training	Development of a Consolidated Action Plan	December 9 and 11-13, 2019 (4 days)	26
	ToT on Communication Skills with Livestock Farmers	April 4-13, 2021 (10 days)	10

Development of a consolidated action plan course (3-year action plan development requested by the JICA Office)

In October 2019, a consultation meeting was held among the JICA Pakistan Office, the Department key officers, and the project team to discuss the progress of project activities and sustainability improvement measures. In the meeting, the JICA Pakistan Office requested the project team to develop a 3-year action plan and budget proposal for the period after the project completion in July 2020 (then) and after.

Following this, the team members responsible for each Output developed their own 3-year action plans. In December 2019, a four-day training course was organized together with the IRM to develop a consolidated action plan, aiming to secure sustainability after the completion of assistance from JICA. In total, 26 officers, including the P/M, DPM, technical C/Ps, extension team members, CBU members, and other Department officers, participated in the training course. They first worked on refining the Output-level action plans (activities and budget) and then consolidated all four Output-level plans into one. The consolidated action plan aimed to achieve the following six targets first under the current project structure in the 1st first year (2020 to 2021) and then under the newly restructured project in the 2nd and 3rd years from 2021 to 2023. The consolidated action plan was finalized in January 2020 and submitted to JICA and the Livestock Department.

i) To increase the capacity of 15 V/Os and 75 S/As on the appropriate technologies in the five pilot districts
ii) To increase the capacity of 45 veterinarians to diagnose and treat reproductive disorders in cattle and buffaloes
iii) To strengthen the Kundhi Buffalo Breeders Association for livestock genetic improvement
iv) To promote and replicate the calf salvation model by engaging stakeholders such as NGOs,

commercial farmers, and rural farmers.

v) To disseminate appropriate technologies to 3,000 farmers (1,500 males and 1,500 females)

vi) To build the capacity of 251 Department officers and officials by improving their management skills

3) Training with the PC-I Budget

In the 5th year, the project started to conduct capacity-building training courses for Department officers (both technical and non-technical themes) with the JICA budget as well as the PC-I budget. The main organizer of these courses was the Department; therefore, the C/Ps (either technical C/Ps, extension C/Ps, or CBU members depending on training themes) developed training the contents, whereas the CBU made the necessary logistic arrangements for all courses. JICA experts restricted their roles to only providing the necessary advice. An overview of the courses is presented in Table 3-55.

Table 3-55 Overview of the PC-I Budget Training

Theme	Period	No. of participants	Contents
Extension System and Methods	December 10 to 21, 2018 (10 days)	15	Training to the Department Extension Team, which was newly established in the Directorate of Animal Husbandry. Participants learned the methods of the project Extension Team for extension activities.
Reproduction disorder diagnosis and treatment	February 4 to 8, 2019 February 25 to March 1, 2019 (10 days)	20	Training to Department officers and private veterinarians. Five days of training courses were provided to two groups (10 participants per group).
Refresher ToT	March 20 to 27, 2019 (8 days)	20	Training to project management and social mobilization M/Ts. Participants developed materials and practiced lectures for a training course with the same theme in July 2019 in which they delivered the lectures. Two courses were organized simultaneously.

The project developed M/Ts in the 4th year training course and in the above PC-I budget training course. As shown in Table 3-54, in July 2019, the two courses on project management and social mobilization were delivered by the M/Ts. Eight M/Ts for each course were responsible for delivering at least one lecture. All the M/Ts looked confident in delivering the lectures, which was possible because they had gone through two rounds of ToT and a rehearsal session on the previous day. Some of the social mobilization M/Ts were invited to the World Bank project (Sindh Agricultural Growth Project: SAGP) or other external organizations to deliver lectures on the same theme. They now have various opportunities outside the Department.

Table 3-56 Results of Pre-Tests and Post-Tests (5th Year)

Theme	No. of Participants	Average Score (Pre-Test)	Average Score (Post-Test)	No. of Participants with Completion
CBU Team Building	8	14	28	0 (0%)
CBS Development	17	No pre- and post-tests		17 (100%)
SOP Development 1 (CBU)	9	23	50	4 (44%)
Development of the Consolidated Action Plan	26	No pre- and post-tests		26 (100%)
ToT on Communication Skills with Livestock Farmers	10	No pre- and post-tests		10 (100%)
Project Management (delivered by M/Ts)	20	40	61	14 (70%)
Social Mobilization (delivered by M/Ts)	18	32	66	14 (78%)
Communication Skills with Livestock Farmers	20	24	54	14 (70%)
SOP#6 Development (P/M)	23	No pre- and post-tests		23 (100%)
Communication Skills with Livestock Farmers (delivered by M/Ts)	20	38	81	19 (25%)
Total	171	-	-	141 (82%)

Table 3-57 Results of Feedback from Participants (5th Year)

Theme	No. of Answers	Very Satisfied	Satisfied	Not Very Satisfied	Not Satisfied
CBU Team Building	8	0 (0%)	6 (75%)	2 (25%)	0 (0%)
CBS Development	No questionnaire because of the specialty of the theme				
SOP Development 1 (CBU)	8	4 (50%)	2 (25%)	2 (25%)	0 (0%)
Development of the Consolidated Action Plan	No questionnaire because of the specialty of the theme				
ToT on Communication Skills with Livestock Farmers	No questionnaire because of the specialty of the theme				
Project Management (delivered by M/Ts)	No questionnaire because the training course was delivered by M/Ts				
Social Mobilization (delivered by M/Ts)	No questionnaire because the training course was delivered by M/Ts				
Communication Skills with Livestock Farmers	18	15 (83%)	3 (17%)	0 (0%)	0 (0%)
SOP#6 Development (P/M)	No questionnaire because of the specialty of the theme				
Communication Skills with Livestock Farmers (delivered by M/Ts)	19	14 (74%)	5 (26%)	0 (0%)	0 (0%)

4) Strengthening the CBU (Support on CBS Implementation)

CBU members were selected for the 3rd time in March 2018. The new CBU started its 5th year activities with two full-time officers and seven part-time officers. From the 5th year, a new full-time member joined the CBU, and the range of CBU activities became much broader than before. The CBU was also clearly defined as "a unit to implement the CBS" by the above-mentioned CBS.

(8) Livestock Development Platform Meeting

In total, five platform meetings were held during the project period (once per year). The meeting aimed to share the progress of the project activities with the major stakeholders of the livestock sector in Sindh Province and to encourage cooperation among the stakeholders for developing the livestock sector in Sindh. An overview of all the meetings is given below.

1st Platform meeting

The 1st Livestock Development Platform meeting was held on January 20, 2015. A total of 64 persons, including the Secretary Livestock, the P&D Department, D/G, directors from each Directorate, Deputy Directors of the five pilot districts, other Department officers, Vice Chancellor and professors from Sindh Agriculture University, Vice Chancellor and professors of Sakrand University, commercial banks, private companies, Food and Agriculture Organization (FAO), NGOs, cattle colonies, other livestock farmers, JICA Mission from the headquarters and Pakistan Office, project team members, and C/Ps, participated in the meeting. The meeting went smoothly, even though it was the first time. However, there remains room for improvement from the viewpoint of "confirming each stakeholder's role in livestock development and encouraging cooperation."

2nd Platform meeting

The platform meetings were held on December 3, 2015. More than 60 people including Dr. Hirashima from JICA headquarters, Mr. Kawasaki, Chief Representative of JICA Pakistan Office, Secretary Livestock (only in the afternoon session), D/G, Directors of each Directorate, Deputy Directors of five pilot districts and C/Ps from the Livestock Department, the P&D Department, and the Agricultural Extension Department of the Government of Sindh, two universities including Sakrand University and Sindh Agricultural University, donor agencies such as the FAO, International Livestock Research Institute (ILRI), a World Bank project (SAGP), an Australian project (ASLP), private enterprises such as Engro Foods, NGOs such as SAFWCO, progressive farmers and breeders, and JICA project team experts participated in the meeting.

The meeting started at 10:30 with a keynote address from Dr. Hirashima, followed by an explanation of project activities from the Japanese project team Leader, presentations on the progress of livestock technology development activities from each C/P, and a presentation on the progress of extension activities from a Japanese extension expert.

After that, the meeting continued to a Q&A session and feedback from participants representing different segments. The project team requested the participants to share their comments, especially on the following three topics: i) how to improve the project, ii) their roles and responsibilities for livestock development, and iii) how to collaborate among different stakeholders. As a result, the project team could define the direction of the opinions and discussions at the meeting. The meeting ended at 16:00.

Two important remarks were made at the meeting. The first was that the meeting increased the appeal of the project activities among the participants because the C/Ps' presentation skills had improved significantly and because the project itself had been making visible progress. Second, the Secretary Livestock stated in his policy remarks that the project activities should be continued even after the termination of JICA's assistance and, for this, PC-IV should be prepared at an appropriate time to assure its budget.

3rd Platform meeting

On January 18, the 3rd Livestock Development Platform meeting was held, inviting stakeholders of the Sindh Province livestock sector, including governmental organizations, other donor agencies, universities, NGOs, private companies, progressive farmers/breeders, and commercial farmers. The meeting started with an opening remark from the D/G, followed by a keynote address from Dr. Hirashima titled "Agricultural Growth and Social Stability through JICA Livestock Development Project," a presentation on the project progress by the P/M, and presentations on the highlights of appropriate technology development and extension activities by the C/Ps. Many questions were raised by participants regarding the appropriate technology development and extension activities.

Subsequently, the floor was opened to the participants. Representatives from universities, NGOs, private firms and donor agencies, progressive farmers, and JICA shared their views on the project and approaches to livestock development in the Sindh Province. The project requested participants to provide comments and suggestions on the following three topics: i) improvement of project activities, ii) their roles and responsibilities in livestock sector development, and iii) how to strengthen coordination among stakeholders for livestock sector development. The participants suggested that women and families should be more frequently involved in the project activities and should share their concrete ideas for coordination, such as universities to provide training or companies to welcome interns.

	
3rd Platform meeting	4th Platform meeting

4th Platform meeting

The project organized the 4th Platform meeting on December 12, 2017, inviting stakeholders in the Sindh livestock sector. In the 4th year platform meeting, the project aimed at sharing its unique activities in technology development such as i) the impact of formula feed developed together by the project and a private company, ii) technical guidance on andrology by a Bolivian expert, Dr. Videz, which was the first attempt in Pakistan, and iii) calf salvation activities in coordination with a local NGO, along with the extension activity, and its merits and challenges when conducted by female veterinary officers. Each presentation was made by

C/Ps in charge of each activity.

In the 4th year, the C/Ps' presentation skills were greatly improved. Participants were able to digest the outcomes and meaning of the project well, and thus left very positive comments. This was the most successful platform meeting in the past four years. In addition, the C/Ps and the Department took initiatives in arranging the meeting and making presentations, which confirmed the increase in the capacity of the Department for organizing platform meetings.

5th Platform meeting

The 5th Livestock Development Platform meeting was held on December 5, 2018, with the objective of presenting and sharing the project outcomes over the past five project years with stakeholders in the Sindhi and Pakistani livestock sectors. The C/Ps made all the necessary arrangements to prepare and organize the meeting such as program development, participant invitation, hall set-up, facilitation, and presentation during the meeting. More than 80 people from inside and outside the Department attended the meeting and exchanged opinions on how to take over the project activities after completion of the main phase in January 2019. The meeting ended successfully because of the C/P's efforts, which confirmed the fact that the Department would continue to take initiative in organizing the meeting after the next year.

	
The Secretary Livestock (2nd from the right) and other important guests, 5th Platform meeting	Private instituions also participated in the 5th Platform meeting

3.7.2 Products

Below is a summary of the project outcomes produced through Output 4 activities

1	In total, 680 Department officers participated in 38 project management training courses (including 27 "basic skill training" courses) conducted by the project. Of the 680 officers, 447 completed the training courses and acquired the basic project management related skills (e.g., Project cycle management, PC-I development, report writing)
2	In total, 30 M/Ts were developed through "M/T training" courses on three different subjects of project management, social mobilization, and communication skills with livestock farmers (10 for each). They will be able to deliver training courses on the same subjects independently.
3	After five years of the project Management Training series, Department officers now understand the importance of learning livestock technologies as well as managerial skills. As a result, Department officers

	now use the terms “PDM” and “SOP” as a common language.
4	The CBU was established, strengthened, and is now able to plan, implement, and follow-up training courses. The CBU is expected to be a permanent unit that plans, implements and follows up any kinds of training courses organized within the Department.
5	Overall, six SOP documents on project activities were developed through “SOP development training” courses. Department officers can refer these documents when they implement the project activities.
6	The CBS was developed. The Department now has its own guidelines for human resource development. The action plan and budget proposal were also prepared.
7	The Department can now conduct Livestock Development Platform meetings that invite Sindhi livestock sector stakeholders independently.

Table 3-58 lists technical cooperation products for Output 4.

Table 3-58 List of the Technical Products of the Project

Type	Title	Submission Year	Contents	Appendix No.
Baseline Survey Report	Training Needs Assessment of Department Officers.	1st year	A summary of the results regarding needs assessment for 11 training themes in institutional development of the Department and enhancement of project management capacity that were suggested according to the M/P Study Report.	T4-1
Livestock Department Operation Guideline	SOP for Extension Activity	3rd year	A document that regulates each procedure of the extension activity (Included in the Extension Guideline).	T4-2
	SOP for V/O&S/A Training	4th year	A document that regulates the implementation procedures of the V/O and S/A training.	T4-3
	SOP for 90 Days Calf Salvation	4th year	A document that regulates the necessary procedures of the few-days calf salvation activity.	T4-4
	SOP for Few Days Calf Salvation	4th year	A document that regulates the necessary procedures for the 90-days calf salvation activity.	T4-5
	SOP for Training Planning and Management	5th year	A document that regulates the implementation procedures of capacity building training (both technical and management training) carried out by the CBU	T4-6
	SOP for Carrying out the PSLD Project Activities from 1st July, 2021	5th year	A document that regulates the methods for comprehensively managing and promoting all the project activities from Output 1 to 4.	T4-7

Type	Title	Submission Year	Contents	Appendix No.
	Capacity Building Strategy	5th year	A document that shows the strategic principles and required action plans for human resource development in the Livestock Department	T4-8

Table 3-59 lists other project for Output 4.

Table 3-59 List of the Other Products of the Project

Title	Submission Year	Contents	Appendix No.
Action Plan for 3 Years from July 2020	5th year	Plan and budget for project implementation by the Department after the completion of JICA's assistance	Z4-1

3.7.3 Levels of Achievement of Indicators

Provided below is a summary of PDM Ver. 4 Output 4 indicators and Table 3-60 summarizes the levels of achievement as of June 30, 2021.

Narrative Summary	Objectively Verifiable Indicators
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-1. The annual plan report of the Project is prepared by the initiative of the Department. 4-2. The results of monthly monitoring is reported by the responsible district offices. 4-3. The annual evaluation report of the Project is prepared by the initiative of the Department. 4-4. The Livestock Development Platform is regularly held by the initiative of the Department. 4-5. The Standard Operation Procedures (SOP) is issued by the Department.

Table 3-60 Levels of Achievement of Indicators

Indicator No.	Levels of Achievement of Indicators
4-1	A field visit and W/S for evaluating the previous year's project activities and for planning the same year's activities were conducted among the project team members every year. The activity plans were developed, reflecting the C/Ps' and project members' opinions. In S/C and Platform meetings, the C/Ps and project members took initiative in planning the events, making presentations on the progress of the project and answering questions from participants. Various training courses on project management skills were conducted, and thus, many officers now understand the importance of having a cycle of planning and evaluating projects. However, the Department has still not reached a level where it can "initiate" and conduct project cycle management of all projects including this project.
4-2	The progress of appropriate technology development activities (Output 1 and 2) was regularly reported in the C/P meeting held every Friday. The progress of extension activities (Output 3) was monthly reported from District offices to the Provincial office according to the reporting structure and flow for the extension activities and monitoring, which had been clarified in a training course. For training

Indicator No.	Levels of Achievement of Indicators
	related activities (Output 4), the CBU held regular meetings among members and also with Japanese experts. From these results, this indicator is considered to have been achieved.
4-3	Same as 4-1.
4-4	Five Platform meeting were held during the project period. The Department initiated the planning and organization of the 4th and 5th meetings; thus this indicator is said to have been achieved.
4-5	Six SOP documents were developed but are yet to be announced as official Department documents. The documents will be utilized when the Department continues the project activities after its completion.

3.7.4 Project Sustainability after Project Completion

The project strengthened the Department's human resource development capacity mainly by supporting the CBU. As a result, the CBU was equipped with the capacity to plan training events according to Department officers' needs, to conduct such training events and their follow-up independently. It is essential that the CBU continue to exist in the Department for continued human resource development activities.

At the beginning, the project depended on Department directors for selecting training participants; therefore, motivated or suitable officers were not always selected for the training courses. As a result, there were issues such as a low attendance rate or a low percentage of participants who passed the post-tests. Therefore, the project introduced a system of "pre-testing" that selected the most suitable officers as training participants through two steps of a written exam and an interview. As a result, many competent and motivated officers were able to participate in the training courses. The project also introduced a "post-test" at the end of the course so that participants would obtain a certificate of either completion or attendance depending on the results of the test. This is considered a good method for increasing the cost performance of each training course. In addition, the project received feedback from participants to training organizers and resource persons. Owing to this practice, the quality of training increased significantly. The Department is expected to continue introducing the measures undertaken during the project when it conducts such training events in the future.

The 3-year action plan includes a list of training themes with priority and the budget for implementation; it is thus ideal that the budget be allocated according to the action plan. It is suggested that the Department should start conducting three training courses on project management, social mobilization, and communication skills with livestock farmers because 30 Department officers have already been developed and certified as M/Ts by the project.

3.8 Measures for Improving Project Sustainability and Future Prospects

The previous sections described the project activities and outcomes. In summary, "most of project purpose and Output-level indicators were achieved. However, it is still a matter of concern whether the overall goal indicators will be achieved or not." During the project implementation period, both the Japanese and Pakistani project members worked for the project as one team, sincerely and passionately. It is usually

sufficient if a project aims to simply achieve the PDM indicators. However, this team always aimed to achieve more, and directed their efforts accordingly. The project faced various challenges throughout the process, but always overcame these with good teamwork and produced good results. The project was thus able to leave huge assets to the Department in terms of "building up of a foundation for livestock development from the technical, human resource, and institutional viewpoints," which was the main project target.

Now, it is the Department that needs to utilize the foundation with its own initiatives. As the M/P study also indicated, the Sindh Government and the Livestock Department have systematic and structural defects; therefore, project sustainability has been questioned since the beginning of the project. Therefore, the project aimed to achieve the project purpose as well as undertook "measures for sustainability improvement" which were not included in the PDM, to enhance project sustainability. The next few paragraphs describe the results of these measures and their future prospects, some of which are already mentioned earlier in this report. These measures can be classified into four aspects: budget, institutional structure, human resource development, and knowledge/know-how.

【Budget】

(1) Securing the Activity Budget

The project at the Sindh Government side was considered to have been "completed as of June 2020" because of which, there had been no budget allocation for one year after that. The project tried to support the development of Schedule for New Expenditures (SNE) and PC-IV so that the Department would be able to secure a regular budget and continue the project activities after project completion. The JICA President raised this issue when he met the chief minister (C/M), but it also ended up in vain. The Sindh Government has been suffering from a serious shortage of the budget in recent years, so it is understandable that obtaining a new budget is extremely difficult. Therefore, the project now encourages the Department to extract only those activities that do not require any budget (e.g., training courses that can be delivered by officers such as C/Ps and M/Ts) from the "3-year action plan" and to carry out only those activities. In this manner, by doing only "what it can do," the Department is expected to continue at least some of the project activities.

【Institutional Structure】

(2) Restructuring the Department

The project repeatedly raised three issues regarding the Department's institutional structure: i) there were no directorates and bodies for human resources that would continue the extension activities; ii) there was no structure for continued training for human resource development; and iii) the Directorate of Planning and Monitoring, which is supposed to apply the project management cycles from planning to evaluation, was not fully functional. The project team also frequently visited the Secretary Livestock in Karachi to discuss these issues.

In the 4th year, the project developed a plan for restructuring the Department. The three objectives of the restructuring plan, prepared by the project, were to establish and strengthen the CBU according to CBS, establish an extension structure, and strengthen the Directorate of Planning and Monitoring, as shown in Figure 3-27

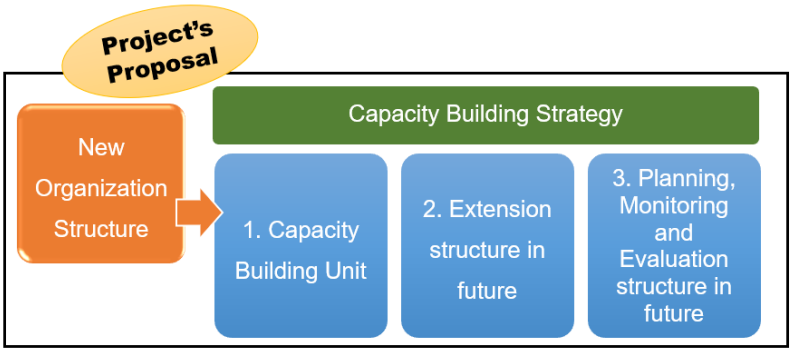


Figure 3-27 Project's Proposal on Restructuring the Department

Consultative W/S (on 13 February 2020)

Having discussed this proposal, the 6th S/C in December 2017 under the chairmanship of the then Secretary Livestock, Mr. Syed Sohail Akbar Shah, decided to officially start the process of restructuring of the Department. Following this decision, the technical committee (T/C) for restructuring the Department was established, and Dr. Vighio, the current D/G (as of June 2021) was assigned as the leader of the T/C. After going through discussions between the project and the T/C, the final draft proposal on restructuring the Department was submitted by Dr. Vighio to the Secretary Livestock on December 24, 2019, and an explanation was made.

On February 13, 2020, the 1st consultative W/S was held under the initiative of the current Secretary Livestock, Mr. Aijaz A. Mahesar (as of June 2021), inviting almost all key officers of the Department to discuss the final draft proposal. The 2nd W/S was held on February 2, 2021, in Karachi, after a long break due to the COVID-19 outbreak, under the chairmanship of the Minister Livestock with only a limited number of participants including the Secretary, the Deputy Secretary, and the D/G. Since then, there have been no discussions until now.

The Department has a plan to recruit 500 new veterinarians and the recruitment process is on progress. Throughout the process, Dr. Aziz, DPM, and Dr. Anisa, Extension Team Leader from the project team were recruited as regular Department officers. The project team has been requesting the Secretary Livestock, as a new structure should be established for accepting 500 veterinarians, to allocate some of them who are motivated and suitable for the extension activities. The project team hopes that the appropriate actions will be taken.

(3) Establishment of the Extension Structure in Pilot and Non-Pilot Districts

Following suggestions from the TE Mission, it was decided that the Directorate of Animal Husbandry would continue the extension activities until the restructuring of the Department was completed. One V/O and two S/As in each of the five pilot districts were selected as "District Extension Team" members

and participated in the training courses conducted by the project extension team. In January 2019, the District Extension Team of three districts (Hyderabad, TMK, and Badin) started the extension activities with the PC-I budget. However, these activities were stopped in December 2019 because little progress had been made. The reasons were that the members were not able to spare time for this additional duty and that no daily allowance had been provided to them.

This implies the difficulty of continuing the extension activities without having an extension structure within the Department and assigning full-time officers for the activities. As mentioned above, Dr. Anisa is now a regular Department officer, so the project expects that she could be a focal person (F/P) to restart the extension activities.

(4) Establishment of the Reporting and Monitoring Structure

The project has repeatedly suggested that a reporting and monitoring structure should be established within the Department so that it can operate and implement all their projects more smoothly. The project extension activities established and applied a reporting and monitoring structure, so that the Department could learn from the project experience when it develops a reporting and monitoring structure in the future. This is an issue that involves the entire Department; therefore, as mentioned above, it is important to "strengthen the Directorate of Planning and Monitoring" through restructuring of the Department, which is already included in the restructuring proposal.

(5) Establishment and Strengthening of the CBU

The project has repeatedly suggested that the Department should establish a permanent "training implementation unit," that is, the CBU, to systematically and sustainably conduct the technical and managerial training courses necessary for Department officers. The CBU is now responsible for performing training needs assessment, selecting participants, conducting training courses, and conducting follow-up after the training courses. In addition, the CBU has the long-term role of conducting research on training institutes, negotiating training implementation, and supporting individual Department officers' human resource development. All of these are included in the restructuring proposal. During the project period, two officers were assigned as permanent CBU members. The project hopes that these two officers will continue to work for the CBU and conduct training courses.

【Human Resource Development】

(6) M/T Development

Ideally, technological transfer should occur within the Department in both the technical and managerial fields. For this, the project selected the most important subjects for the Department, and provided ToT sessions to C/Ps and the most motivated and competent participants of the basic training courses of the same subjects to develop them as "M/Ts"[26]. The M/T candidates acquired subject knowledge as well as training planning and facilitation skills that are required for good trainers through the ToT sessions. Eight C/Ps for technical subjects and 30 officers for managerial subjects have thus been developed as M/Ts; the

[26] In other words, they are called "subject matter specialists".

Department is thus ready to disseminate technologies within the Department under their initiative.

(7) Core Farmer Development

Core farmer development is one of the Output 3 indicators. It is very important for the project sustainability that the technologies be disseminated from farmers to surrounding farmers spontaneously; therefore this section describes this point again. The project identified core farmers through extension activities and provided training sessions to them. As of May 2021, 14 of 19 core farmers who were then participating in the project training sessions were still disseminating technologies that they had learned to surrounding farmers. The project team wanted to investigate the reasons why they were doing that, but gave it up because the trip to Pakistan was canceled. If these reasons are identified, more core farmers will be able to disseminate the technologies to surrounding farmers.

【Knowledge and Knowhow】

(8) Raising Awareness on Project Management and Basic Skill Improvement

As shown in Figure 3-28, the project provided many project management training courses to the Department officers in pilot districts and non-pilot districts to raise the officers' awareness regarding the importance of managing project cycles and improving their skills in project cycles from the planning, monitoring, and evaluation of projects.

In addition to these training events, the project evaluated the project activities and planned the next year's activities together with the project staff members every year. Thus, terms such as "PDM" and "project management" seem to have become a common language among the project related officers. However, not all the Department officers know these words, so this is still a mid-term or long-term issue that needs to be addressed.

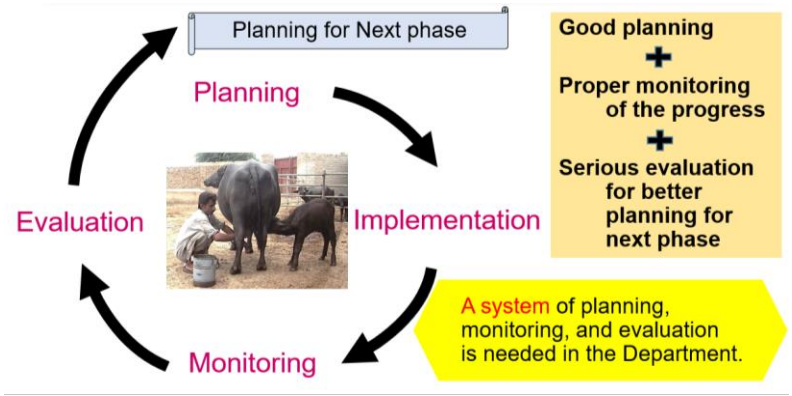


Figure 3-28 Project Cycle and its Importance

(9) SOP Development and Official Approval

The project considered it necessary to prepare an environment where the Department officers could utilize project guidelines and manuals as often as possible after project completion. Therefore, the project developed six SOP documents on the project activities to make sure that the project guidelines and manuals are utilized for the related activities. The project also encouraged the Department to institute a rule that would make the use of these documents mandatory. The project provided SOP training courses to many Department

officers so that the SOP documents could be prepared and utilized by other Department projects. As a result, the term “SOP” seemed to have become a common language, at least among project related officers.

(10) Development of CBS

Following the suggestion of the MTR Mission, the project decided to develop the CBS, which could institutionalize the project training courses within the Department. The aim was to utilize it for continued planning and conducting training events even after project completion for capacity building of the Department officers. In addition, it was also necessary for officers who had participated in training courses to be assigned to the appropriate positions and activities within the Department so that they could utilize their training knowledge effectively. These were the reasons for the development of the CBS.

Chapter 4 History and Details of the PDM Revision

4.1 History of the PDM Revision

Table 4-1 summarizes the history of PDM revision from Ver. 0 to Ver. 4. A more detailed history is presented in Attachment 1.

Table 4-1 History of the PDM Revision

PDM Ver.	Date of Revision	Reasons of Revision
0	12 December 2012	Presented by JICA upon concluding the 1st year consultancy agreement
1	26 November 2014	In August 2014 after six months since the start of the project activities, the project team started to look at the items and indicators on PDM Ver. 0. In November, the team members (Japanese experts and the C/Ps) discussed and revised the PDM Ver. 0 according to the actual situation.
2	8 April 2016	Between March and April 2016, the team looked at some of the indicators that were left undecided on PDM Ver. 1 and at the "Appropriate Technology Development Checklist", which was an attachment to the PDM, and then revised PDM Ver. 1 by setting the target figures.
3	28 December 2016	Revised PDM Ver. 2 (including the Appropriate Technology Development Checklist) through internal discussions among team members and external discussions with JICA according to the recommendations from the MTR Mission.
4	11 October 2018	Revised some of the PDM Ver. 3 indicators (the 1st project purpose indicator and the 2nd overall goal indicator) according to the recommendations from the TE Mission.

4.2 Revision of the Project Purpose, the Overall Goal and the Output-Level Indicators

4.2.1 Revision of the Project Purpose

Below is a summary of details for the revision of the project Purpose indicators from PDM Ver. 2 to PDM Ver. 4 and the relevant reasons and findings.

To clarify "extension steps"

- ✓ The PDM Ver. 2 did not specify the targets to be achieved through the extension activity. For indicators that could evaluate the levels of technology application, the project team considered that extension of technology would take the following steps: "The project teaches technology (to farmers through training)" → "The technology is delivered (to farmers)" → "(The farmers) start to use the technology" → "(The farmers understand the merits of the technology and use it regularly)." Based on this, the project team reorganized the indicators of the project purpose, overall goal, and Outputs on PDM Ver. 3 and after.
- ✓ The target indicator of the new project purpose was the number of farmers who had gone through a certain period of time since they received the first training session from the project (for the PDM Ver.3) or the last training session from the project (for the PDM Ver.4).
- ✓ The indicator on PDM Ver. 3 was set on the assumption that the number of farmers who use the

technology would increase gradually (10% increase one year after receiving the first training session and 20% increase after two years). In contrast, the indicator on PDM Ver. 4 was set on the opposite assumption that it would gradually decrease (only 70% would continue to use the technology one year after receiving the last training session and only 50% thereafter).

To clarify "appropriate technology"

- ✓ PDM Ver. 2 did not specify the details of the "Appropriate Technology," which was used for one of the project Purpose indicators. After completing verification at the P/F and completing the "Appropriate Technology Checklist," the project team decided to use the checklist and to pick up only those technologies for which the team could physically observe the farmers' practices (which were named "A rank technologies").
- ✓ The target population of the relevant indicator on PDM Ver. 2 was "farmers who use the appropriate technologies regularly." However, this has been revised for PDM Ver. 3, as "farmers who use the appropriate technologies (A rank technologies)"

To change project purpose indicators to Output-level indicators

- ✓ The second and third project purpose indicators on PDM Ver. 2, namely, "Average milk yield of cattle/buffaloes of the pilot farms increases by 25%." and "Average daily gain of cattle/buffaloes of the pilot farms increases by 10 %." were changed to Output 1 indicators.
- ✓ Likewise, the fourth indicator of "The number of calves salvaged by the project per year is 50." were changed to Output 2 indicators.

To add new project purpose indicators

- ✓ On PDM Ver. 3 and Ver. 4, the following three new indicators were added to the original project purpose indicators on PDM Ver. 2: (1) "The Standard Operation Procedures (SOP) implemented by the Department to apply the guidelines of technology, the extension plan, and materials prepared by the project for the entire Department." (Reason: It was not enough just to develop the guidelines and implement the activities.); (2) "Some stakeholders in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes" (Reason: The project Purpose should also have Output-2 related indicators.); and (3) "The counterparts, extension workers, and other staff including incumbent officers in the pilot districts have the capacity to support farmers according to the guidelines prepared by the project." (Reason: The project should also look at the levels of capacity building.)

Changes due to the delay in the project activities

- ✓ PDM Ver. 2 originally targeted 1,500 farmers per district, of a total of 7,500 farmers who "use the appropriate technologies regularly." Due to a significant delay in the start of the extension activity, however, the target number was revised to 3,000 farmers (2,000 male and 1,000 female farmers) and was then changed to an Output 3 indicator.

4.2.2 Revision of the Overall Goal

The overall goal was also revised to comply with the revised project purpose. The overall goal and indicators on PDM Ver. 4 are listed in Table 4-2.

Table 4-2 Overall Goal and the Indicators of the PDM Ver. 4

Narrative Summary	Objectively Verifiable Indicators
Overall Goal The appropriate technologies and methods for utilizing livestock resources are adopted by the farmers in and outside the pilot districts.	1. Appropriate technologies are disseminated to more than 3,000 livestock farmers in the project districts and more than 800 livestock farmers in non-pilot districts 2. More than 50% of the target farmers regularly use at least one of the nine "A" rank appropriate technologies shown in the attached Appropriate Technology Development Checklist as monitoring indicators. 3. Some more stakeholders (e.g., commercial farmers, NGOs, target groups) in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes.

The following is a summary of details for revising the overall goal indicators from PDM Ver. 2 to PDM Ver. 4 and the relevant reasons and findings.

- ✓ The first Overall Goal indicator on PDM Ver. 2 was "Another 20% of the target group in the project districts (1,500 livestock farmers in five districts) and 750 livestock farmers outside the pilot districts use the appropriate technologies regularly." For this reason, however, it was revised to be "Appropriate technologies are disseminated to more than 3,000 livestock farmers in the project districts and more than 800 livestock farmers in non-pilot districts."
- ✓ Together with this, a new indicator for the number of farmers who "use the appropriate technologies ("A rank" technologies)" was added.
- ✓ An Output 2-related Overall Goal indicator of "Some more stakeholders in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes" was newly added.
- ✓ The original PDM Ver. 2 had the indicator of "the target group have increased their incomes and assets." However, the project team changed it to a super goal after considering the progress of the project.

4.2.3 Revision of Output-Level Indicators

The Output-level indicators were also revised to comply with the abovementioned revisions. The Outputs and indicators of PDM Ver. 4 are listed in Table 4-3.

Table 4-3 Outputs and Indicators of PDM Ver. 4

Narrative Summary	Objectively Verifiable Indicators
Output 1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms.	1-1. Effectiveness of appropriate technologies is verified at 25 pilot farms with the following indicators: 1) Average milk yield of cattle/buffaloes increases by more than 25 % compared with the current average of farmers in general (4 liters/day) 2) Average daily gain of cattle/buffaloes increases by more than 10 % compared with the current average of farmers in general (250 g/day) 1-2. The counterparts have the capacity to instruct extension workers and incumbent officers on the contents of the technology guidelines prepared by the Project.

Narrative Summary	Objectively Verifiable Indicators
2. The methods for utilizing livestock resources are verified.	2-1. The survival rate of calves in 3 months after birth at the Calf Salvation Center exceeds 90% with the technology for salvaging new born calves. 2-2. The methods of calf salvation including rearing by farmers are proven to be economically viable. 2-3. It is confirmed that dry buffaloes are salvaged with improved reproduction technologies. 2-4. The counterparts have the capacity to promote effective use of livestock resources to the public and private entities according to the guidelines prepared by the Project.
3. The verified appropriate technologies and methods for utilizing livestock resources are disseminated in the pilot districts with gender consideration.	3-1. The counterparts, master trainers, and extension workers have the capacity to instruct farmers according to the extension plans and materials prepared by the Project. 3-2. Appropriate technologies are disseminated to about 3,000 (2,000 male and 1,000 female) farmers. 3-3. Effective methods for farmer-to-farmer dissemination of technologies are demonstrated.
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-1. The annual plan report of the Project is prepared with the initiative of the Department. 4-2. The results of monthly monitoring are reported by the responsible district offices. 4-3. The annual evaluation report of the Project is prepared with the initiative of the Department. 4-4. The Livestock Development Platform is regularly held with the initiative of the Department. 4-5. The Standard Operation Procedures (SOP) is issued by the Department.

The following is a summary of the details for the revision of Output-level indicators from PDM Ver. 2 to PDM Ver. 4, and the reasons and findings for that (PDM Ver. 3 and the Ver. 4 were the same).

Output 1

- ✓ The PDM Ver. 2 simply said that "Appropriate technologies are verified at 25 farms" However, it was revised to say more specifically that "Average milk yield of cattle/buffaloes increases by more than 25% compared with the current average of farmers in general (4 liters/day)" and "Average daily gain of cattle/buffaloes increases by more than 10% compared with the current average of farmers in general (250 g/day)"
- ✓ The PDM Ver. 2 said that "70% of the responsible counterparts, including master trainers and extension workers, acquire contents of the extension plan and materials prepared by the Project." However, it was revised to say that "The counterparts have the capacity to instruct extension workers and incumbent officers on the contents of the technology guidelines prepared by the Project" because the project team thought it better to limit the target population of this indicator and to examine the "technology application" aspect as well as the "technology instruction" aspect.

Output 2

- ✓ Likewise, "70% of the responsible counterparts and concerned livestock farmers understand the guidelines for utilizing livestock resources." was revised to "The counterparts have the capacity to promote effective use of livestock resources to the public and private entities according to the guidelines prepared by the Project."
- ✓ "The rate of survival of the calves salvaged by the project is 90%." on the PDM Ver. 2 was revised to say more specifically that "The survival rate of calves in 3 months after birth at the Calf Salvation Center

exceeds 90% using the technology for salvaging new born calves.".

- ✓ New indicators of "The methods of calf salvation including rearing by farmers are proven to be economically viable." and "It is confirmed that dry buffaloes are salvaged using improved reproduction technologies." were added.

Output 3

- ✓ Likewise, 70 % of the responsible counterparts, including master trainers and extension workers, acquire contents of the extension plan and materials prepared by the Project." on the PDM Ver. 2 was revised to "The counterparts, master trainers, and extension workers have the capacity to instruct farmers according to the extension plans and materials prepared by the Project."
- ✓ Due to the significant delay in the initiation of the extension activity, "Appropriate technologies are disseminated to 7,500 farmers (95% of farmers by extension workers and 5% of farmers by farmer-to-farmer)" was revised to "Appropriate technologies are disseminated to about 3,000 (2,000 male and 1,000 female) farmers".
- ✓ A new indicator of "Effective methods for farmer-to-farmer dissemination of technologies are demonstrated." was added.

Output 4

- ✓ No change.

4.3 Recommendations from the MTR and TE Missions and Actions to Be Taken

Tables 4-4 and 4-5 summarize the recommendations from the mid-term review mission and the terminal evaluation mission and suggested actions to be taken by the Livestock Department and the project. All the suggested actions for the recommendations from the mid-term review mission (August 2016) were taken during the project duration. Likewise, almost all the actions for the recommendations from the TE Mission (September 2018) were taken, except for some of the actions that are still in progress as of June 2021 due to reasons such as cancelation of the Japanese experts' last trip to Pakistan in May 2021 because of the COVID-19 pandemic.

TE Mission

Table 4-4 Recommendations from the Mid-Term Review Mission and Actions to Be Taken by the Department and Project

No.	Recommendations from the Mid-Term-Review Mission (In the special S/C meeting)	Actions to Be Taken
1	Input for supporting Breeders' Association should be optimized within the range of achievement of the project Purpose.	The project will concentrate only on milk testing and pedigree registration, but will not work for establishing or strengthening the Breeders' Associations.
2	Methods of utilizing buffalo calves and dry buffaloes should be made economically viable for the target group.	The project will work on it as recommended, and the results will be shown in the Guideline at end of the 3rd year for buffalo calves and the 4th year for dry buffaloes.
3	Involvement of incumbent technical staff (V/Os) and para-technical staff (S/As) in the pilot districts should be incorporated within the present activity for securing sustainability.	It is expected that the V/Os and S/As become able to provide useful messages to farmers on livestock production in their routine work. The Department will allocate the funds necessary for the project to conduct training for them in the revised PC-I. This training will take place in the 4th and 5th year.
4	The current five F/Ps should also be continuously engaged in the project for utilizing their knowledge and experiences.	It is confirmed that five F/Ps will be continuously engaged in the project, and the Department will allocate necessary funds in the revised PC-I.
5	The project should consider pilot farmers as possible facilitators for farmer-to-farmer knowledge dissemination.	The project will consider it as recommended, including the core farmers as facilitators. The Department will allocate the funds necessary for the project to organize demonstration visits to these farmers in the revised PC-I.
6	Effective strategies for human resource development planning should be prepared and training opportunities should be allocated to the appropriate number and position of the staff following the plan.	The Department will prepare a human resource development strategy (tentative) with the project on technical as well as non-technical aspects. Costs for technical training will be borne by the Department, whereas non-technical training will be borne by the project as before and additionally by the Department. The necessary budget of the Department will be included into the revised PC-I.
7	Follow-up after training should be considered for the utilization of outcomes by the staff.	This has been already considered by the project, but will be intensified.
8	For smooth and effective dissemination of technologies, coordination between Output 1 and 3 should be improved.	The project will revise Appropriate Technology Development Checklist. In addition, Extension Guideline will be prepared by the entire project staff for the extension workers.
9	The current PDM (Ver. 2) should be reviewed and revised based on the suggestions made by the MTR study team.	The project will review and revise the PDM by the end of December. The revised PDM will be explained for approval at the 2nd Special Steering Committee Meeting to be held in January 2017.
10	Supporting system for P/M till full-time P/M recruitment should be strengthened.	The Department will ensure that the P/M is strongly guided by D/Gs and all the directors.
11	The mechanism of PC-I budget release should be shared with the project execution team for both sides.	(1) The project will clarify when and what information should be shared by the Department to them at regular basis, and (2) the Department will do the same to the project.

No.	Recommendations from the Mid-Term-Review Mission (In the special S/C meeting)	Actions to Be Taken
12	Incumbent technical and para-technical staff should be given the opportunity to learn the project outcomes (appropriate technologies).	As described in No.3
13	Rapid actions for making PRI sustainably operational and effective use of laboratory equipment procured by JICA in a mini-laboratory in the Department building as well as in PRI should be planned and implemented.	The Department will complete the necessary work for the equipment provided by JICA at the PRI and mini-laboratory to be functional. The Department will allocate a CVDL officer to work at the mini-laboratory.
14-1	Relevant support and advise for earlier settlement of the following delayed issues should be processed among the related government offices with the shared time-schedule: (1) purchase of vehicles and motorbikes	Secretary Livestock will send a re-appropriation proposal to the Finance Department through the P&D Department
14-2	(2) recruitment of 10 female extension workers	The requirement for extension workers will be made clear in the revised PC-I.
14-3	(3) revision of PC-I	Draft of the revised PC-I will be sent to the Secretary Livestock from the Department, and to the P&D Dept. from the Secretary Livestock
14-4	(4) recruitment of full-time P/M	Immediately after the revised PC-I is approved, the Secretary Livestock will reorganize the selection committee.
14-5	(5) Project allowances to counterpart staff	Immediately after the revised PC-I is approved, the Department will start paying an allowance to the counterpart staff.
15	Continuous support for the assignment of human resources, provision of budget and equipment by PC-I, and PC-IV in the future (after the project).	PC-IV will be prepared in August 2018.
16	The revised PC-I shall be designed and approved in a manner that all the technologies developed through JICA assistance reach the targeted number of farmers.	The Department will prepare the draft of the revised PC-I in collaboration with the project team, taking the recommendations into consideration. The draft will be sent to the Secretary Livestock when completed.
17	JICA budget for the 4th year project activities should be carefully examined in proportion to the counterpart fund of the Sindh government, which has already been behind schedule, for the fear of further delay. The progress of PC-I release and input from the Livestock Department should be confirmed not later than February, 2017 for JICA's action.	JICA may take some actions depending on the situations in February 2017 (There was no need for any actions because the actions for the left-mentioned suggestion were taken).

Table 4-5 Recommendations from the TE Mission, Actions to Be Taken by the Department and the Project and the Progress as of June 2021

No.	Recommendations from the TE Mission (September 2018)	Action Plan	Progress (as of June 2021) Actions in progress are shaded
To be completed by January 2019			
1	PR of the project products	The project team will shoot a promotion video.	Short videos for the topics of "formula feed", "calf salvation activity (in Urdu)" and "animal breeding" were developed and submitted to JICA Pakistan Office. All videos were uploaded to the Livestock Department's YouTube channel.
2	PDM revision	The project team will develop a draft, explain it in the 9th S/C meeting and get approval.	The PDM Ver. 4 was approved in the said meeting.
3	Recruitment of a full-time P/M	Dr. Asad Ishaque is a person-in-charge. The target date is November 2018.	Dr. Mushtaque Hussain Jokhio was recruited at the end of April 2019 and started to work for the project.
4	Notification of the project products as the Department's official documents and procedures	The project team will issue a request letter to the D/G. Then the project and Department will discuss and agree on the measures to make utilization of the developed products possible.	The project products were handed over to the Department in January 2019 at the 10th S/C meeting except for a few products that were later handed over to the Department in March and June 2021. A project management training course was held in April 2021 to discuss the measures for ensuring the utilization of the project products such as the SOP after project completion. However, the commitment of the Department for continuation of the project activities is essential.
5	Proper management of sales and incomes of buffalo in the "special revolving fund" for calf salvation activities	The project team will develop a TOR of utilization for the revolving fund. Then the Department will organize an "account management committee". The D/G and the P/M will be joint account holders and get approval from the Finance Department.	On January 22, 2020, a simple account was opened at the Sindh Bank under the name of the "Calf Salvation Center" and with Dr. Shahani and Dr. Naeem as signatories.
6	Extension of the R/D period to June 2020	The process needs to be completed by December 2018. Dr. Muzafer Ali Vighio is the person-in-charge.	The signing of the Minutes of Meeting (M/M) for the R/D revision was completed.

		
EXPO2020 venue	A project booth at the EXPO2020	Exhibition of the calf salvation activity

No.	Recommendations from the TE Mission (September 2018)	Action Plan	Progress (as of June 2021) Actions in progress are shaded
To be completed by June 2020			
7	PR of the project products: Utilizing the Department website and the Livestock Development Platform, organizing a national PR seminar and doing PR through local TV and radio programs.	Dr. Liaquat Ali Abro (Animal Breeding) is the person-in-charge. Another officer will be assigned from the Directorate of Animal Husbandry.	It was decided to develop leaflets that would summarize the outcomes of all the technical activities. It was also decided to review the PR plan, to upload the project products including the videos on the website and YouTube, to explain the project activities at livestock shows and exhibitions and to utilize the opportunity of an annual platform meeting, and that the P/M would owe the sole responsibility for these. The project outcomes were already introduced at several events, and the results were shared widely on platforms like Facebook. For example, the project outcomes were widely publicized at the Livestock EXPO 2020 (held in February 2020) and EXPO 2021 (held in 2021), in which the project set up a booth and demonstrated the calf salvation activity. However, the project gave up the idea of organizing the platform meeting in June 2020 and publicizing the project outcomes due to the cancelation of the experts' trip to Pakistan.
8	One-year extension of the revised PC-I to be completed by March 2019. Preparation of the PC-IV to be completed by December 2019.	The DPM and Dr. Meena Memon were the persons-in-charge	Extension of the project period until June 2021 was officially approved as a result of the PC-I revision and re-revision. The PCR/PC-IV, the SNE and the finalized 3-year action/budget plan were developed and submitted. However, the budget for the continuation of the activities is yet to be allocated.

No.	Recommendations from the TE Mission (September 2018)	Action Plan	Progress (as of June 2021) Actions in progress are shaded
9	Getting approval from the Sindh Government on restructuring the Department	Dr. Abdul Qadir Junejo (Chairperson, Restructuring Committee) will finalize the restructuring plan and submit a summary to the Secretary Livestock and then to the C/M.	The Secretary Livestock instructed the Department to set up the Technical Committee to discuss restructuring the plan (with Dr. Vighio, the D/G, as a chairperson). On December 24, 2019, the final draft of the plan was submitted and was explained by Dr. Vighio to the Secretary. On February 13, 2020, a consultative W/S was held with the initiative of the Secretary, in which most of the Department key officers participated. However, the 2nd W/S originally planned on 25 March was postponed and is yet to be organized.
10	The Directorate of Animal Husbandry takes over extension activities, while the Directorate of Animal Breeding takes over breeding activities until the restructuring of the Department is completed	Dr. Abdul Mannan Khokhar was in charge of the extension activity. Dr. Abdul Latif Keerio is in charge of breeding activity.	One V/O and two S/As in the five pilot districts have been selected as members of the Department Extension Team. They have started field activities in January in three districts (Hyderabad, Badin, and TMK) by the PC-I budget. The Director of Animal Breeding is supporting breeding activities as per 17 activity plans developed by the C/Ps.
11	Proposing Sindh Government for provision of subsidies, bank loans, and any support to lessen the initial and rearing costs to run calf salvation as a business	Invite a member of the Sindh Board of Investment (BOI) to the Platform Meeting. Farmers can submit a proposal to the BOI, which introduces the farmers to financial institutions. Dr. Musharaf Malkani and Dr. Meena Memon are persons-in-charge.	The MOU was exchanged between SMFB and MOU. 10 heads of calves were reared at the salvation center and distributed to farmers through the collaboration project with SMFB.
To be supported continuously			
12	Timely disbursement of the revised PC-I budget	The DPM and Mr. Gulab Soomro (Account Officer) are persons-in-charge.	The draft release order for the 1st and 2nd quarter of 2019/20 was submitted by the Secretary Livestock Office to the Finance Department. The Finance Department approved the disbursement of Rs.25.9 million, which was equal to 50% of the 2019/20 budget. The remaining 50% was distributed and disbursed soon after that.

Chapter 5 Project Implementation and Management - Challenges, Measures, Lessons Learnt, and Suggestions

5.1 Success Factors, Challenges, and Measures

After going through several extensions, the project was implemented for the period of seven and half years. Through such a long project period, it aimed at "building up a foundation for livestock development" and implemented a wide range of activities that included various livestock technology fields, extension activities, capacity building of Department officers, and institutional development. The number of Japanese experts involved in the project was 16, and many local project members among Department regular and contract officers, including the D/G, P/M, eight technical C/Ps, 22 extension team members, two CBU full-time members and several part-time members, seven calf center staff members (one V/O, one S/A, and five workers) and other staff members hired by the project including Dr. Sarwar, ex-D/G of the Department carried out the project activities. Considering that both the technical and management training courses were provided to any Department officers, the project was considered to be implemented by the collaborative efforts of several hundred Department officers who participated in the project training courses.

The project faced many issues throughout the implementation process; however, as mentioned earlier, most of the project indicators were achieved. This chapter first analyzes the success factors of the project and then raises several issues.

(1) Commitment of the Project Team Members

The most prominent success factor is that all local project team members were seriously involved in the project activities. They tried their best to learn from the Japanese experts and showed their commitment to achieving the project indicators, which resulted in project success. They worked under situations where payment of daily allowance was always delayed due to the delay of disbursement from the Sindh Government budget. Extension team members had to work without receiving any salary for several months after being recruited by the Department. Some of them continued the project activities using their own motorbikes for their visits to villages by paying for fuel from their own expenses. The Japanese team would like to appreciate and respect their efforts.

(2) Support from the Livestock Department

The Japanese experts and the Department trusted each other highly because they had worked together for the past 10 years since the start of the M/P Study. The entire Department supported and cooperated with the project activities. The Department sincerely and promptly responded to requests from the Japanese side by offering a project office, involving officers in the project activities, taking actions for day-to-day issues, and so on. As the project outcomes became more visible, the Department was more interested and involved itself more actively in the project activities, such as in the technical and management training and budget allocation for the calf salvation activity. Without such support from the Department, the project could not have produced the many outcomes that it sees today. The project would also like to thank the Livestock Department.

(3) Farmers' Interest and Motivation

One of the main project site was the P/Fs. Technology verification, technical guidance, and technology dissemination - all of these activities started at the P/Fs. To select such important persons, the project developed very strict selection criteria and spent more than one year in the entire selection process. The sincere efforts of such P/Fs who had received technical guidance from the project allowed increased milk production and body weight of calves. Calf salvation beneficiary farmers also reared and distributed the calves very carefully, which led to a high survival rate.

Many farmers participated in the farmers' training sessions. More than half of them utilized technologies that they had learned in the training sessions, even one year after the session. When starting the extension activity, many Department officers mentioned that "the project should distribute some gifts to encourage farmer participation in the training sessions". However, the project was able to achieve a big target of "technologies disseminated to 3,000 farmers" in a very short period without providing any gifts to farmers. The project proved the fact that "good technological information itself can be an incentive for farmers to participate in training sessions," which implies that farmers are interested and motivated enough to learn new technologies, and that support can be effective with a proper approach and proper contents. The project hopes that the Department understands this fact and utilizes this lesson for future support to farmers.

(4) Structural Issues in the Sindh Government

The following sections mention the important issues and measures taken by the project.

In the Sindh Government, the Secretary Livestock was the main person responsible for implementing this project. The requests for decisions on important project implementation matters such as budget, procurement, recruitment, etc., were sent from the project to the Secretary, and in some cases from the Secretary to the P&D Department, the Finance Department, the Services, General Administration & Coordination Department, the C/S, or C/M according to the subject.

The major issues were that i) the Secretary Livestock, who was supposed to be the main person of the project, was frequently transferred (the project welcomed as many as 15 new secretaries during the project implementation period); ii) the Sindh Government was highly centralized and most of the decisions were made by the C/M, so many issues were left aside for quite a long time until the decisions were made (In the worst case, the decision was never made).

Because of this, the main person responsible for the project was always ambiguous, which greatly affected project progress. In addition, the ownership of the Sindh Government was not well developed, and so, there is still a concern regarding project sustainability.

As the project implementer, the project team considered such situations as given or external factors and thought of project operation, management, and sustainability issues to the maximum extent possible. This means that the Department had to establish a structure where the project activities would be continued sustainably regardless of whoever the Secretary was. Therefore, the project aimed to i) raise awareness and the levels of ownership among Department officers (especially current and future key officers) and ii) institutionalize as many project activities as possible for establishing environments where the Department "had no other options than to do it." These were the reasons why the project provided training courses to many Department officers and developed the SOPs.

(5) Delayed Recruitment of Project Staff Members and Procurement of Project Vehicles

Another major impact of the above-mentioned structural issues was the extremely delayed recruitment process of project staff members involved in the extension activity and procurement of vehicles to be used for the extension activity in villages. The original plan was to complete the process within the 1st year, but the recruitment of project staff members was completed in the 3rd year whereas the procurement of vehicles was completed in the 4th year. The project repeatedly talked to the Secretary Livestock, who promised to take necessary actions every time. However, very little progress was made because of the Sindh Government's structural issues in decision making. The Japanese team spent a lot of time solving this issue and suffered from this additional burden. The lessons learned from this were that staff recruitment and vehicle procurement should not be included in the project framework when planning new projects in future.

(6) Budget Shortage

The Sindh Government is said to be facing a serious budget shortage. Possibly because of this, the project was not able to realize allocation of the regular budget for continuation of the project activities. This could have been another reason for the delayed process of recruitment and vehicle procurement during the project implementation period, despite the fact that the PC-I budget was allocated. To minimize the negative impacts caused by budget shortages or delayed budget disbursements, measures should be taken to ensure that the donors disburse as big a budget as possible when implementing projects in Sindh Province. The project took the same measures and consulted with JICA about these issues whenever necessary.

(7) Lack of Policies and Strategies

This is a point that was also mentioned in the M/P Study report, but there is still no livestock development policy even after 10 years since the M/P Study. The project team heard several rumors that one of the secretaries had expressed his intention to develop the policy or that the World Bank had decided to support the policy development, but neither of these has happened so far.

Because of the lack of a policy, the Livestock Department does not have a clear objective for their activities. This is also a point that has been indicated quite often, but the Livestock Department, being an institution consisting of many veterinarians, is good at animal health services such as treatment and disease prevention of animals but is still not good at "development of the livestock sector." These were the reasons why this project promoted the "development of a 100-year foundation for livestock development." However, to utilize and reinforce this foundation, the Department should have a livestock policy and its own strategy for realizing the policy, and should develop each Directorate's activity plan based on the same strategy. The project hopes that the Department finds its raison d'être in this direction when fulfilling its expected roles in the future.

(8) Lack of Project Management Capacity

In addition to the Livestock Department, the entire Sindh Government lacks the concept of project management. There are two major issues to be addressed. One is that lessons from previous experiences are not utilized for the next opportunities because they do not have a cycle of planning, monitoring, and evaluation. During the project period, the P&D Department officers sometimes made a 1-day or 2-day visits

to the project to monitor its activities and the budget disbursement situation. However, they made evaluations based on their own personal observations without understanding the project; thus, many of their comments were not accurate. Therefore, there were many cases where the Department or project staff members requested modification of the evaluation results. Another issue was time management. As mentioned above, every decision-making item was reported to superior authorities because of the highly centralized structure. This eventually required a long time until a decision was made, which delayed project activities. When talking with Sindh Government officers, the project team often received answers that "they would talk to their superior authorities" rather than receiving answers that "they would complete it by when" This was the reason why the project put its efforts in conducting project management training to raise awareness regarding the importance of "project management". The project team hopes that the government introduces at least a concept and method for a "Plan of Operations' at many of its Departments and enables proper time management.

5.2 Lessons for Project Implementation and Operation

(1) Period Required for Technology Verification and Extension Activities

It was not until the 3rd year that the project was able to identify the first what-can-be-called "appropriate technology" after technology verification at the P/Fs. After that, the project started the extension activity to disseminate the technology to surrounding farmers, but it was only during the 5th year that the project achieved the target of "technologies are disseminated to 3,000 farmers' because of the delayed recruitment of extension team members. As the TE Mission also pointed out, it is important that "farmers' training (technology extension) and monitoring of technology application (promotion of use) in pilot districts should be continued for at least one or two cycles of conception and milking". This point that "it requires significant time" needs to be considered when the JICA develops livestock technical cooperation projects in future.

(2) Indicators to Measure Outcomes of an Extension Activity

The project conducted trials and errors to set the indicators for measuring the outcomes of the extension activity. During the process, the project reached an understanding that the developed technologies would go through the steps of "the project disseminates technologies to farmers by training", → "farmers understand the technologies," → "farmers use the technologies," → and "farmers understand the advantages of the technologies and use the technologies regularly" to be disseminated among many farmers. With this understanding, the project was finally able to decide on the Output-level indicators, project purpose indicators, and overall goal indicators. However, the project learned the difficulty of obtaining real answers from farmers when it interviewed them in the extension monitoring survey, which aimed to determine the extent to which the farmers utilize the technologies. Therefore, the project targeted only technologies that the extension team members were able to confirm visually. These findings are possibly applicable to this project as well as to other projects that involve extension activities.

(3) Information Sharing with Other Institutions

At Livestock Development Platform Meetings and on other occasions, many participants showed

interest in collaborating with the JICA project. One of the original project targets was "to involve and to coordinate livestock sector stakeholders, and to encourage them to play their own role in livestock development," so the project welcomed such offers of collaboration. However, the project accumulated a huge volume of exclusive information such as a huge volume of regularly collected raw data, technological information brought by Japanese livestock experts, and the results of livestock technology verification, all of which should be treated as the intellectual property of the project.

Therefore, the project established a rule that "in principle, raw filed data that had been collected by the project, technological information from Japanese experts, and the results of verification should not be shared with external institutions unless there was a special permission." It is difficult to decide to what extent the project can coordinate with other institutions or to share information with those institutions, but what is important is to always be aware of who owns the intellectual property rights.

5.3 Suggestions for Achievement of Overall Goal and Sustainability Improvement

(1) Project Sustainability Improvement Measures

The objective of this project was "to build up a foundation for livestock development in the pilot districts. The foundation refers to livestock technology, human resource, and institutional foundations. The project expected its activities to be continued on these foundations and expand into the pilot and non-pilot districts in the mid-and long-run, which would result in an increase in the income and assets of livestock farmers in Sindh Province. Therefore, the project was planned and implemented assuming that it would continue for a long time in the future.

In terms of building foundations, the project has verified the appropriate technologies, the results of which were compiled into technological guidelines. The project also developed human resources who understood these technologies and who were able to disseminate the technologies to farmers. The extension method was also verified. All related manuals and guidelines for project activities have been developed. On the contrary, the Department's institutional capacity and systems that enable the above-mentioned activities are still weak. The foundation building seems to require more time, and the Department still needs continuous back-up support from external entities in this aspect. The budget for continuing the project activities will, of course, be required, but there is still no prospect on budget allocation of the budget. If all of the above issues are solved, project sustainability will greatly improve.

The measures for continuing the project activities after its completion are mentioned in Chapter 3. Table 5-1 summarizes the suggestions from the project team on how to implement each of these measures. The project implemented all the measures mentioned in Table 5-1 during the project implementation period. There are very few technical cooperation projects that take many sustainability improvement measures as the project does. The PDM of this project did not include these measures, even though project sustainability was always questioned since the M/P Study and since the beginning of the project; the project team thus thought it essential to take the necessary measures as early as possible. However, regular budget allocation was never promised during the project period regardless of the project's efforts. Temporary hired extension team members finished their contracts and went back to the private sector. This is nothing more than a loss of precious human resources and know-how that have been accumulated through the project experience and knowledge if the project is completed without solving the above-mentioned issues; the Department is thus

strongly expected to continue the project activities in any way possible.

Table 5-1 How to Implement Project Sustainability Improvement Measures (Suggestions)

Project Sustainability Improvement Measures		How to Implement the Measures (Suggestions)
【Budget】		
1	Securing the Activity Budget	The project was completed in June 2021. The Department now has to develop PCR/PC-IV and submit it to the Sindh Government. The Department is recommended to re-request the Sindh Government to allocate the necessary budget for continuing the project activities or, if this is difficult, to request the C/M for allocating a special budget. However, it is unlikely that the request will be accepted in either case. Nevertheless, there is a possibility of approval on human resource allocation, that is, continuous assignment of C/Ps to the project activities. Starting from this, the Department is expected to continue some of the project activities even with a very small amount of the available budget. As the project developed such human resources as C/Ps and M/Ts on project management related subjects within the Department, the Department can conduct training courses without any budget, thus mobilizing these officers as trainers.
【Institutional Structure】		
2	Restructuring of the Department	Many instances of discussions on the restructuring of the Department have been held among the Minister Livestock, the Secretary Livestock, the D/G and almost all the other Department key officers. All the participants have recognized and agreed on the necessity of restructuring. There is little possibility of the restructuring plan being rejected by the Finance Department because it does not require any additional budget. However, a strong commitment of the Secretary Livestock and the Sindh Government leaders is required to realize such a major transformation of the Department. The project team has observed that the Sindh Government is yet to recognize the importance of the Livestock Department's role in livestock development, which the project continued to highlight by implementing the project activities. Therefore, the Department still needs to repeatedly continue suggesting the importance and necessity of establishing a Directorate of Extension. The Department has already decided to recruit 500 veterinarians. Taking this opportunity, the Department is expected to recruit veterinarians who are interested in technology extension to farmers and to assign them to extension activities. By completing this, it is expected that extension activities will be restarted. Continuous follow-up to the Secretary Livestock is important.
3	Establishment of the Extension Structure in Pilot and Non-	Dr. Anisa, a female Extension Team Leader, was recruited by the Livestock Department as a regular officer. Establishment of an extension structure will not happen until restructuring of the Department takes place, but the Department can restart the extension

Project Sustainability Improvement Measures		How to Implement the Measures (Suggestions)
	Pilot Districts	activity by assigning her the responsibility of the extension activity and mobilizing officers who are interested in the extension activities. Continuous follow-up to the Secretary Livestock is again important.
4	Establishment of the Reporting and Monitoring Structure	Establishment of a reporting and monitoring structure also depends on restructuring the Department. As mentioned later, the Sindh Government still does not understand the concept and methods of "project management;" therefore, it is important to steadily continue providing training sessions to as many Sindh Government officers as possible (especially, to decision-making level officers) and let them understand the importance of project management.
5	Establishment and Strengthening of CBU	The project provided various training courses on both technical and management subjects to Department officers who lacked such training opportunities before. Throughout the training implementation process, the CBU developed its capacity of initiating the whole process from training needs assessment to planning, implementation and follow-up. Two full-time officers were assigned to the CBU; thus, it is important to continue their assignment at the CBU, which requires an action to obtain the consensus of the Secretary Livestock
【Human Resource Development】		
6	M/T Development	As mentioned above, C/Ps can immediately start delivering training courses to other Department V/Os and S/As. Likewise, 10 officers were certified as M/Ts on three management-related subjects (project management, social mobilization and effective communication with livestock farmers), and they are thus ready to deliver training courses to other officers on the same topics.
7	Core Farmer Development	The project developed 19 "core farmers". Of these, 14 still continue to play an intermediary role in transferring technologies to other farmers. During the project implementation period, the project had to halt this due to the COVID-19 outbreak, but the Department will be able to develop more core farmers if essential factors for enabling farmer-to-farmer technology transfer are identified through a social survey.
【Knowledge and Know-hows】		
8	Raising Awareness on Project Management and Basic Skill Improvement	The Sindh Government does not understand the basics of project management; therefore, the Government develops plans without having any strategy or policy, or without evaluating its past experiences. The centralized system requires a long process from approval of plans to allocation of the budget. Implementation and monitoring is done without subjectivity. Therefore, as mentioned above, it is important to continue providing training to decision-making level officers in a stepwise manner so that they will understand the importance and basics of project management.
9	SOP Development and Official	The project developed many manuals and guidelines (attached to this report) that include six SOP documents on Output 1 to 4 activities. Even Department officers newly

Project Sustainability Improvement Measures		How to Implement the Measures (Suggestions)
	Approval	assigned to the project activities will be able to understand how to use the other manuals and guidelines and to implement the activities by reading these documents. It is important to continuously talk to the Secretary Livestock to approve those SOP documents as official documents of the Department.
10	Development of CBS	The project developed the CBS so that the Department could plan and implement training (especially on management subjects) to Department officers systematically. The guideline describes each of the short-term, mid-term, and long-term issues that require actions, and so, the Department is expected to use the guidelines when planning training for Department officers in the future.

The D/G and C/Ps understand the importance of continuing the project activities, but the decisions should initially be made by the Secretary Livestock and other Sindh government decision makers and Departments such as the C/M, Minister Livestock, C/S, Finance Department, Services, General Administration & Coordination Department, and P&D Department. The D/G and C/Ps are expected to promote the actions of higher authorities. A back-up support from the JICA Officers for their efforts is also strongly needed.

(2) 3-Year Action Plan

As mentioned in Section 3.7.1 (7), in January 2020, 3-year action plans on each of Output 1 to 4 were developed to enhance project sustainability after the completion of JICA assistance. Implementation of the plan was intended to start in July 2020, but can be started at any time when the budget is allocated for any of the actions of each Output. Table 5-2 summarizes the major actions included in the plan and the 3-year targets to achieve.

Table 5-2 3-Year Action Plan and Targets

Outcome	Major Actions	3-Year Targets
1	1. Appropriate technology training for Department V/Os and S/As 2. Reproductive disorder training for private veterinarians 3. Hoof-cutting training for private technicians	1. To increase the capacity of 15 V/Os and 75 S/As on appropriate technologies in five pilot districts 2. To increase the capacity of 45 veterinarians on the diagnosis and treatment of reproductive disorders in cattle and buffaloes. To strengthen the Kundhi Buffalo Breeders Association for livestock genetic improvement 3. Six times of hoof-cutting W/S.
2	1. Continue the calf salvation activity at the calf center 2. Expand the calf salvation activity by coordinating with NGOs and microfinance institutions.	1. 240 calf salvation cases. 2. To promote and replicate the calf salvation model by engaging stakeholders such as NGOs, commercial farmers, rural farmers, etc.

Outcome	Major Actions	3-Year Targets
3	Extension of appropriate technologies	To disseminate appropriate technologies to another 3,000 farmers (1,500 male and 1,500 female)
4	Continue management training to the Department officers	To build the capacity of 251 Department officers and officials for improving their management skills

In the P/M training course in April 2021, the project requested C/Ps and other training participants to propose ideas on "how to implement the action plan without any budget allocation." As a follow-up action, in July 2021, the D/G and the C/Ps took initiative in reviewing the action plan and started discussion "for establishing the PSLD Management Committee for implementing the action plan." Once the plan is developed after the discussions, the D/G will submit the plan to the Secretary Livestock. However, there is also the possibility that such a positive atmosphere will be lost due to human resources and budget constraints. The JICA Office's strong support is again requested for the Department to implement at least part of the action plan activities.

It is possible to conduct a follow-up of some of the Output 1 activities listed in Table 5.2 through a mini-technical cooperation project on reproduction that will start in or after this year.

5.4 COVID-19 Impact and Necessary Measures

Just before project completion, the project was faced with the COVID-19 outbreak and the lockdown measures (movement restriction). This was an opportunity for the project to review how to react in such emergency situation in future. The project conducted a survey on the impact of the COVID-19 pandemic on project activities with the objective of extracting lessons for project sustainability improvement.

(1) Survey Outline

- ✓ Objective: (1) To identify the impact of the COVID-19 pandemic on the project outcomes (which are described in PDM Ver. 4), both from the technical and institutional aspects, and (ii) to make a list of suggestions to the Department on the necessary measures for enhancing project sustainability in preparation for similar cases in future, based on the survey findings.
- ✓ Interviewees: Livestock farmers and others for technical aspects. Department officers and extension workers for institutional aspects.
- ✓ Interviewers: Eight technical C/Ps, one CBU chairperson (training C/P), and one extension C/P for technical aspects. Dr. Sarwar, a national staff member, for the impact on Department officers and extension workers (institutional aspects)
- ✓ Responsibilities of the Japanese experts: Decide survey methods, develop questionnaires, summarize and analyze the results, and make suggestions. Communicate with interviewers via WhatsApp or other means

(2) Technical Aspects

Survey Period: February 24 to June 30, 2021

Interviewees: 96 rural farmers, seven cattle colonies, 22 milk shops, and 25 butchers. All in the pilot districts.

Survey Results (Impact of COVID-19 and Lockdown Measures):

- ✓ Of the cattle colonies and rural farmers, 100% and 81.3%, respectively answered that their income had decreased.
- ✓ The main sales destination for the cattle colonies was the milk shop. The main sales destination of rural farmers was middlemen, which accounted for 50% of the answers. There were also various other sales destinations; thus, the same distribution pattern continued even under the lockdown measures.
- ✓ Among the rural farmers and the cattle colonies, 60.6% and 85.7%, respectively answered that the milk price had decreased.
- ✓ Among the cattle colonies, 40% answered that their milk sales were the same. Of the rural farmers, 22.4% answered that the milk sales had been the same, whereas 38% answered that they sometimes had not been able to sell milk.
- ✓ Of 22 milk shops, 21 answered that their income and the volume of milk supply had decreased. Milk sales prices were decreased at 73% of the shops. Yogurt sales prices had decreased at 55% of the shops.
- ✓ The main sales destinations of adult buffaloes were butchers and markets (50% for each) at the cattle colonies and middlemen (86%) at rural farmers, which were not different from the usual sales destinations even under the lockdown measures. However, 100% of the cattle colonies and 82.4% of the rural farmers answered that adult female buffalo sales prices had decreased.
- ✓ Among the butchers, 92% answered that their income had decreased, and 93% answered that their supply of meat had decreased. Only 37% of the butchers answered that the meat sales price had decreased, whereas 59% of them answered that they had been the same. This is considered to be because the meat sales price is officially guaranteed.
- ✓ Many farmers (69.3% of cattle colonies and 56.8% of rural farmers) answered that the supply volume of concentrated feed and formula feed had not changed.
- ✓ The most frequently used feeds are wheat bran, palm cake, and maize crush at the cattle colonies, and wheat bran, rice polis, and cotton seed cake at the rural farmers, which were not different from before, even under lockdown measures.
- ✓ Of the cattle colonies and rural farmers, 100% and 73.9%, respectively answered that the fodder price had increased.
- ✓ Seven of seven cattle colonies (100%) and 92 of the 96 rural farmers (96%) answered that they had adopted natural breeding with breed bulls whereas four farmers had used artificial insemination. Of the farmers, 82.8% answered that natural breeding had not cost anything at all.
- ✓ At the cattle colonies, private veterinarians conducted the medical treatment of buffaloes in 38.5% of the cases, whereas the farmers themselves did so in another 38.5% of the cases. In the latter case, the farmers are the workers who were hired by the cattle colonies and were good at taking care of buffaloes. Among the rural farmers, the Livestock Department officers provided medical treatment in 40.8% of the cases, whereas private veterinarians did so in another 40.8% of the cases; therefore they tended to depend on the service of external technicians. Only 14 farmers (18.4%) completed their treatments by themselves.
- ✓ The lockdown measures lasted only for a short period; therefore there were only a few accident cases. However, 14.1% still answered that the mortality rate had increased, which implies the importance of continuous service even under lockdown measures.

- ✓ One hundred percent of the cattle colonies and 99% of the rural farmers answered that they needed guidance for preventing COVID-19 infection. There were almost no guidance opportunities for training, seminars, and workshops where people had to gather socially, which would have increased the risk of infection.
- ✓ According to a total of 103 farmers (seven cattle colonies and 96 rural farmers), milk and goat meat were the two least frequently purchased items because the farmers produced milk by themselves and goat meat was expensive. All other items were purchased frequently. There were no changes before and after the implementation of lockdown measures.
- ✓ A total of 53.3% answered that the purchase price of milk had decreased. A total of 57.1% answered that the purchase price of beef had not changed. The purchase price of items other than these two items was increased.

Conclusion:

- ✓ The survey revealed that the lockdown measures for COVID-19 prevention had a significant impact on the cattle colonies and farmers.
- ✓ Many farmers (100% of the cattle colonies and 81.2% of the rural farmers) answered that their income had decreased. The main reasons for the income decrease were a decrease in the sales price of milk and adult buffaloes. Of the cattle colonies, 42.9% answered that their milk sales were the same, whereas only 22.4% of the rural farmers answered so.
- ✓ The purchase price of the formula feed, concentrated feed, and daily necessities (except for milk and beef) increased.
- ✓ One of the important assumptions of the PDM is that the pilot and surrounding farms are not affected by serious floods or droughts". The lockdown measures as a result of the COVID-19 pandemic had a significant negative impact on farmers that equaled the impact of floods or droughts. However, there was almost no impact of the COVID-19 pandemic on the project outcomes because all PDM indicators regarding the technical aspects of the project had been achieved by then during the five project years. The price of concentrated feed and formula feed decreased, but the supply continued even with movement restriction, with only slightly delayed cases. The same technical levels were maintained because natural breeding was performed in most reproduction cases. It is possible that farmers and buffaloes are resilient against such adverse circumstances because they have been living for many years under severe conditions.
- ✓ However, project extension activities suffered significantly from movement restrictions. Further details are described in the results of the COVID-19 impact survey on institutional aspects.

Suggestions:

Based on the survey results, the following measures to enhance project sustainability are suggested. The Livestock Department is expected to implement these measures.

Continue calf salvation activity for poor farmers

Owning livestock assets was found to be useful in such emergency situations. The sales price decreased, but the sales of milk and adult buffaloes continued to contribute to securing the farmers' income. Providing livestock assets for poor people through the calf salvation activity is also important as a poverty reduction measure, which is worth continuing as an eye-catching activity of the Department.

Continue medical treatment service to farmers under lockdown measures

The survey discovered a few cases of buffalo death. It is suggested that the Department should take strong initiatives to prioritize the vaccination of V/Os and S/As so that they will be able to continue their service to farmers (medical treatment, vaccination of animals, and deworming) as much as possible.

Promote farmer group establishment

The cattle colonies were able to sell milk at high and stable prices, even under lockdown measures. Rural farmers are not so resilient against external impacts such as the COVID-19 pandemic; thus, it is better to promote the establishment of farmer groups as much as possible so that they can consistently provide a substantial amount of milk. It is suggested that the Department should provide guidance to farmers for establishing farmer groups and improving the sales and distribution of milk.

(3) Institutional Aspects

Survey Period: March 2 to May 28, 2021

Interviewees: 14 Department V/Os of rural clinics, 12 V/Os of the district offices, and four extension workers

Questions and Responses (Impact of COVID-19 and Lockdown): As shown in Table 5-3

Conclusion:

COVID-19 and movement restriction due to lockdown measures have directly and indirectly caused a negative impact on the ordinary working of Department officers and project extension activities in various aspects. The COVID-19 pandemic prevented Department officers from providing their usual service of treatment and disease prevention, and some of them mentioned that "they started to lose the farmers' trust." Project extension workers mentioned that "some of the farmers thought that the project had been completed" because they had not been able to visit the villages, and thus answered that "it had become difficult to achieve and maintain the project targets."

Suggestions:

Under such circumstances, the project suggests the following actions to be taken by the Department:

- ✓ Development and implementation of emergency measures: In preparation for emergency situations, count the number of medical supplies, disinfectants, and diagnosis kits stocked at each clinic, and add the required number of stocks.
- ✓ Exemption of movement restrictions: Request the government to exempt Department officers from movement restrictions so that they can continue treatment and disease prevention services as well as extension activities.
- ✓ Advice to farmers: Always try to provide the latest information to farmers and contact them when there is any change in service provision from the Department and project. In such cases where veterinarians are not able to provide direct service, suggest priority disease prevention measures that can be implemented by a limited number of people.
- ✓ Securing communication methods: Secure communication tools so that officers can always provide the necessary advice to farmers.
- ✓ Request farmers and market managers to report to the nearest Department office regarding any unknown cases of animal death during the outbreak of infectious diseases.
- ✓ Respecting COVID-19 prevention measures and actions (Do not approach farmers, animals, and

markets when there is a possibility of being infected. Always wear a mask. Keep hands clean. Maintain a safe distance between each other.

- ✓ Assign responsible officers to emergency response tasks. Review the budget.

Table 5-3 Impact of COVID-19 and the Lockdown Measures (Institutional Aspects)

Answer: 1: Almost no impact, 2: Slightly negative impact, 3: Negative impact, 4: Serious negative impact, 5: Very serious negative impact.

Question	COVID-19 Impact (Answers) %					Remarks
	1	2	3	4	5	
1. Impact of movement restriction on provision of usual service such as treatment, disease prevention and extension activity			25.0	53.6	21.4	No serious impacts were observed in rural areas where movement was not so strictly restricted.
2. Impact of decrease in the number of workers on the quality of usual service (especially animal heath related service)	3.6		35.7	46.4	14.3	There were no serious impacts observed at rural clinics that were managed by only one veterinarian who had grown up in the same area.
3. Impact on supply and stock of medicines and vaccines at rural clinics	3.6	3.6	35.7	21.4	35.7	Same as 1.
4. Impact on budget allocation and disbursement for continuing ordinary works	17.9		25.0	28.6	28.6	The answers varied according to the amount of the budget provided to each district office. There were no serious impacts observed at district offices with a smaller budget amount.
5. Impact of movement restriction on infectious disease surveillance, monitoring and reporting activities	7.1		14.3	42.9	35.7	There was no impact of movement restriction because no infectious disease survey and monitoring activity was conducted as there were no other infectious diseases observed.
6. Impact of movement restriction on farmers' access to treatment and extension service	3.6		28.6	32.1	35.7	Same as 1.
7. Impact on the project activities for capacity building of the Department			7.0	32.0	62.0	Learning processes such as participation in training events was suspended.
8. Concern about the impact of COVID-19 on yourself when you continue your usual service at fields.			7.0	25.0	68.0	
9. Impact on incomes from individual treatment service that you do during non-working hours	14.0		21.0	39.0	25.0	Department officers are allowed to provide individual treatment services for a fee during non-working hours.

Question	Information Source	Slightly Useful	Useful	Very useful	Remarks
10. From which source do you get COVID-19 related information and to what extent was it useful? (%)	TV	7	29	64	Some of the interviewees answered that "information from social media is not trustworthy" or that "they rarely used the radio as a source of information in recent days."
	Radio	93	7	0	
	Newspaper	18	50	32	
	Social media	21	25	54	
	Website	11	71	18	
	Other source	0	0	4	

Questions	Slightly satisfied	Satisfied	Very satisfied	Remarks
11. To what extent are you satisfied with COVID-19 prevention advice provided by one of the above information sources? (%)	3.6	53.6	46.4	Some of the interviewees answered that "websites of public institutions such as National Command and Operation Centre (NCOC) were trustworthy" or that "TV played an important role."

Question	Slightly serious	Serious	Very serious	Remarks
12. In general, how serious was the impact of the COVID-19 on the Department or the project? (%)	7.0	25.0	68.0	Provision of personal protection equipment to field officers was suggested as one of the possible measures.

Attachment

Project on Sustainable Livestock Development for Rural Sindh
in the Islamic Republic of Pakistan

Project Completion Report
(Attachment)

Table of Contents

Attachment 1 History of the PDM Revision from the Ver. 1 to the Ver. 4

Below is the history of the revision of the PDM from the draft Ver. 0 to the latest Ver. 4.

Ver. 0 to Ver. 1

In August 2014, which was 6 months since the start of the Project activities, the Project Team started to look at the descriptions and the indicators of the PDA Ver.0, which had been provided by JICA when concluding the consultancy agreement. The whole Project Team (Japanese experts and the C/Ps) discussed and revised the PDM by taking local contexts into consideration and developed the PDM Ver.1.

Ver. 1 to Ver. 2

On 29 June 2016, the Project Team members including the C/Ps had a discussion to finalize some of the indicators that had been left undecided on the PDM Ver. 1. The Team first looked at the items and the achievement goals of the "Appropriate Technology Development Checklist", which was an attachment to the PDM, and then agreed to revise some of the items according to the real situation. Following this, on 8 April, the Team again discussed among the members and decided all the target figures for the PDM indicators. Consequently, the PDM Ver. 2 was developed together with the newly set indicators and also with the revised "Appropriate Technology Development Checklist".

Ver. 2 to Ver, 3

Following the recommendations from the Mid-Term Evaluation Mission, the Project Team discussed among the members and also with JICA to revise the PDM Ver. 2 and the "Appropriate Technology Development Checklist". The revision was made as of 9 December 2016, when the last discussion among the Team members was held.

Ver. 3 to Ver. 4

Following the recommendations from the Terminal Evaluation Mission, the Project Team revised some of the indicators (the 1st Project Purpose indicator and the 2nd Overall Goal indicator) of the PDM Ver. 3 and made it into the Ver. 4.

The tables for the Overall Goal, the Project Purpose and the Expected Outcomes of the PDM Ver. 1 to 4 are shown in the next pages, followed by the Activities, the footnotes, and the list of A rank technologies on the "Appropriate Technology Development Checklist", which is an attachment to the PDM.

【Overall Goal】

PDM Ver. 1-2

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal The appropriate technologies and the methods for utilizing livestock resources are adopted by the farmers in and outside the pilot districts.	1. Another 20% of the target group in the project districts (1,500 livestock farmers in 5 districts) and 750 livestock farmers outside of the pilot districts use the appropriate technologies regularly. 2. Twenty (20) % of the target group have increased their incomes and assets.	1. Ex-post Survey by the Department 2. Ex-post Survey by the Department	Necessary budget is allocated to the Livestock Department regularly.

PDM Ver. 3

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal The appropriate technologies and the methods for utilizing livestock resources are adopted by the farmers in and outside the pilot districts.	1. Appropriate technologies are disseminated to more than 3,000 livestock farmers in the project districts and more than 800 livestock farmers in non-pilot districts 2. The numbers of the farmers who use the appropriate technologies ("A" rank technologies shown in the attached [Appropriate Technology Development Checklist] regularly increase by 10 % after 1 year and 20% after 2 years from the commencement of technology dissemination in the villages. 3. Some more stakeholders (e.g. commercial farmers, NGOs, target groups) in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes.	1. Ex-post Survey by the Department 2. Ex-post Survey by the Department 3. Ex-post Survey by the Department	Necessary budget is allocated to the Livestock Department regularly.

PDM Ver. 4

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal The appropriate technologies and the methods for utilizing livestock resources are adopted by the farmers in and outside the pilot districts.	1. Appropriate technologies are disseminated to more than 3,000 livestock farmers in the project districts and more than 800 livestock farmers in non-pilot districts 2. More than 50% of target farmers regularly use at least one of the nine "A" rank appropriate technologies shown in the	1. Ex-post Survey by the Department 2. Ex-post Survey by the	Necessary budget is allocated to the Livestock Department regularly.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
	attached Appropriate Technology Development Checklist as monitoring indicators. 3. Some more stakeholders (e.g. commercial farmers, NGOs, target groups) in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes.	Department 3. Ex-post Survey by the Department	

【Project Purpose】

PDM Ver. 1

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Project Purpose The foundation for increasing incomes and assets of livestock farmers is built up in the pilot districts. (development of appropriate technologies, establishment of extension structure, strengthening concerned institution and capacity-building of concerned officers)	In the project districts: 1. Twenty (20) % of the target group of the Project use the appropriate technologies regularly (the number of the target group is about 1,500 in each district and 7,500 in total). 2. Average milk yield of cattle/buffaloes of the pilot farms increases x %. 3. Average daily gain of cattle/buffaloes of the pilot farms increases x %. 4. The number of calves salvaged by the Project per year is x. 5. The Standard Operation Procedures (SPO) is implemented by the Department to apply the guideline of technology, the extension plan and materials prepared by the Project for the entire Department.	Monitoring Survey by the Project	The Livestock Department does not experience significant structural change.

PDM Ver. 2

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Project Purpose The foundation for increasing incomes and assets of livestock farmers is built up in the pilot districts. (development of appropriate technologies, establishment of extension structure, strengthening concerned institution and capacity-building of concerned officers)	In the project districts: 1. The target group of the Project use the appropriate technologies regularly as indicated in the Appropriate Technology Development Checklist (the number of the target group is about 1,500 in each district and 7,500 in total). 2. Average milk yield of cattle/buffaloes of the pilot farms increases 25 %. 3. Average daily gain of cattle/buffaloes of the pilot farms increases 10 %.	Monitoring Survey by the Project	The Livestock Department does not experience significant structural change.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
	4. The number of calves salvaged by the Project per year is 50. 5. The Standard Operation Procedures (SOP) is implemented by the Department to apply the guideline of technology, the extension plan and materials prepared by the Project for the entire Department.		

PDM Ver. 3

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Project Purpose The foundation for increasing incomes and assets of livestock farmers is built up in the pilot districts. (the foundation includes development of appropriate technologies, establishment of extension structure, strengthening concerned institution and capacity-building of concerned officers)	In the project districts: 1. The numbers of the target group (excluding the pilot farmers) who use the appropriate technologies ("A" rank technologies shown in the attached [Appropriate Technology Development Checklist] regularly increase by 10 % after 1 year and 20% after 2 years from the commencement of technology dissemination in the villages. 2. All guidelines developed by the Project are officially acknowledged by the Livestock Department. 3. Some stakeholders (e.g. commercial farmers, NGOs, target groups) in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes. 4. The counterparts, extension workers and other staff including incumbent officers in the pilot districts have the capacity to support farmers according to the guidelines prepared by the Project 5. The Standard Operation Procedures (SOP) is implemented by the Department to apply the guideline of technology, the extension plan and materials prepared by the Project for the entire Department.	1. Monitoring Survey by the Project 2. Interview to the management-level officers of the Department, Meeting minutes 3. Study on successful cases on utilizing livestock resources, interview to the stakeholders adopted the technologies/methods 4. Examination, interview 5. Interview to the management-level officers of the Department	The Livestock Department establishes an implementation structure and allocates budget and staff for disseminating appropriate technologies in non-pilot districts. The counterparts continue to be engaged in the improvement and dissemination of appropriate technologies and knowledge to the other Department officers. • The Livestock Department promotes the technologies/methods of salvaging buffalo calves and dry buffaloes.

PDM Ver. 4

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Project Purpose The foundation for increasing incomes and assets of livestock farmers is built up in the pilot districts. (the foundation includes development of appropriate technologies, establishment of extension structure, strengthening concerned institution and capacity-building of concerned officers)	In the project districts: 1. More than 70% of the target group (excluding the pilot farmers) regularly use at least one of the nine "A" rank appropriate technologies shown in the attached Appropriate Technology Development Checklist as monitoring indicators within one year from training completion. Whereas, more than 50% of the target group continue to regularly use at least one of the same nine technologies even after more than one year from training completion. 2. All guidelines developed by the Project are officially acknowledged by the Livestock Department. 3. Some stakeholders (e.g. commercial farmers, NGOs, target groups) in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes. 4. The counterparts, extension workers and other staff including incumbent officers in the pilot districts have the capacity to support farmers according to the guidelines prepared by the Project (see Note 2 for the target numbers of each guideline) 5. The Standard Operation Procedures (SOP) is implemented by the Department to apply the guideline of technology, the extension plan and materials prepared by the Project for the entire Department. (see Note 4 for the details)	1. Monitoring Survey by the Project 2. Interview to the management-level officers of the Department, Meeting minutes 3. Study on successful cases on utilizing livestock resources, interview to the stakeholders adopted the technologies/methods 4. Examination (see Note 3 for the details), interview 5. Interview to the management-level officers of the Department	The Livestock Department establishes an implementation structure and allocates budget and staff for disseminating appropriate technologies in non-pilot districts. The counterparts continue to be engaged in the improvement and dissemination of appropriate technologies and knowledge to the other Department officers. • The Livestock Department promotes the technologies/methods of salvaging buffalo calves and dry buffaloes.

【Expected Outputs】

PDM Ver. 1

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Output 1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration. 2. The methods for utilizing livestock resources are verified. 3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts. 4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	1-1. Seventy (70) % of the responsible counterparts, including master trainers and extension workers, and pilot farms acquire contents of the technology guidelines prepared by the Project. 1-2. Appropriate technologies are verified at 25 farms. 2-1. Seventy (70) % of the responsible counterparts and concerned livestock farmers understand the guideline for the utilizing livestock resources. 2-2. The rate of survival of the calves salvaged by the Project is x%. 3-1. Seventy (70) % of the responsible counterparts, including master trainers and extension workers, acquire contents of the extension plan and materials prepared by the Project. 3-2. Appropriate technologies are disseminated to 7,500 farmers (x farmers by extension workers and y farmers by farmer-to-farmer). 4-1. The annual plan report of the Project is prepared by the initiative of the Department. 4-2. The results of monthly monitoring is reported by the responsible district offices. 4-3. The annual evaluation report of the Project is prepared by the initiative of the Department. 4-4. The Livestock Development Platform is regularly held by the initiative of the Department. 4-5. The Standard Operation Procedures (SPO) is issued by the Department.	1-1. Survey by the Project 1-2. Monitoring Survey by the Project 2-1. Survey by the Project 2-2. Monitoring Survey by the Project 3-1. Survey by the Project 3-2. Monitoring Survey by the Project 4-1. Interview to stakeholders 4-2. Monitoring Report 4-3. Interview to stakeholders 4-4. Interview to stakeholders 4-4. SPO	Pilot and surrounding farms are not affected by serious flood or drought The World Bank project in Sindh livestock sector coordinates well with this Project.

PDM Ver. 2

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Output			
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-1. Seventy (70) % of the responsible counterparts, including master trainers and extension workers, and pilot farms acquire contents of the technology guidelines prepared by the Project. 1-2. Appropriate technologies are verified at 25 farms.	1-1. Survey by the Project 1-2. Monitoring Survey by the Project	Pilot and surrounding farms are not affected by serious flood or drought
2. The methods for utilizing livestock resources are verified.	2-1. Seventy (70) % of the responsible counterparts and concerned livestock farmers understand the guideline for the utilizing livestock resources. 2-2. The rate of survival of the calves salvaged by the Project is 90%. 3-1. Seventy (70) % of the responsible counterparts, including master trainers and extension workers, acquire contents of the extension plan and materials prepared by the Project. 3-2. Appropriate technologies are disseminated to 7,500 farmers (95% of farmers by extension workers and 5% of farmers by farmer-to-farmer).	2-1. Survey by the Project 2-2. Monitoring Survey by the Project 3-1. Survey by the Project 3-2. Monitoring Survey by the Project	The World Bank project in Sindh livestock sector coordinates well with this Project.
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts.	4-1. The annual plan report of the Project is prepared by the initiative of the Department. 4-2. The results of monthly monitoring is reported by the responsible district offices. 4-3. The annual evaluation report of the Project is prepared by the initiative of the Department. 4-4. The Livestock Development Platform is regularly held by the initiative of the Department.	4-1. Interview to stakeholders 4-2. Monitoring Report 4-3. Interview to stakeholders 4-4. Interview to stakeholders	
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-5. The Standard Operation Procedures (SOP) is issued by the Department.	4-4. SOP	

PDM Ver. 3

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Output 1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms.	1-1. Effectiveness of appropriate technologies is verified at 25 pilot farms with the following indicators: 1) Average milk yield of cattle/buffaloes increases by more than 25 % compared with the current average of farmers in general (4 liters/day) 2) Average daily gain of cattle/buffaloes increases by more than 10 % compared with the current average of farmers in general (250 g/day) 1-2. The counterparts have the capacity to instruct extension workers and incumbent officers on the contents of the technology guidelines prepared by the Project.	1-1. Monitoring survey on cattle and buffaloes of pilot farms by the Project 1-2. Examination, interview	Pilot and surrounding farms are not affected by serious flood or drought
2. The methods for utilizing livestock resources are verified.	2-1. The survival rate of calves in 3 months after birth at the Calf Salvation Center exceeds 90% with the technology for salvaging new born calves. 2-2. The methods of calf salvation including rearing by farmers are proven to be economically viable. 2-3. It is confirmed that dry buffaloes are salvaged with improved reproduction technologies. 2-4. The counterparts have the capacity to promote effective use of livestock resources to the public and private entities according to the guidelines prepared by the Project.)	2-1. Monitoring Survey by the Project 2-2. Monitoring Survey by the Project 2-3. Monitoring Survey by the Project 2-4. Examination, interview, Case of promotion activities by counterpart	
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts with gender consideration.	3-1. The counterparts, master trainers, and extension workers have a capacity to instruct farmers according to the extension plans and materials prepared by the Project. 3-2. Appropriate technologies are disseminated to about 3,000 (2,000 male and 1,000 female) farmers.	3-1. Examination, interview 3-2. Monitoring Survey by the Project	

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
	3-3. Effective methods for farmer-to-farmer dissemination of technologies are demonstrated.	3-3. Case study	
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-1. The annual plan report of the Project is prepared by the initiative of the Department. 4-2. The results of monthly monitoring are reported by the responsible district offices. 4-3. The annual evaluation report of the Project is prepared by the initiative of the Department. 4-4. The Livestock Development Platform is regularly held by the initiative of the Department. 4-5. The Standard Operation Procedures (SOP) is issued by the Department.	4-1. Interview to stakeholders 4-2. Monitoring Report 4-3. Interview to stakeholders 4-4. Interview to stakeholders 4-4. SOP	

PDM Ver. 4

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Output 1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms. (see Note 5 for the details)	1-1. Effectiveness of appropriate technologies is verified at 25 pilot farms with the following indicators: 1) Average milk yield of cattle/buffaloes increases by more than 25 % compared with the current average of farmers in general (4 liters/day) 2) Average daily gain of cattle/buffaloes increases by more than 10 % compared with the current average of farmers in general (250 g/day)	1-1. Monitoring survey on cattle and buffaloes of pilot farms by the Project	Pilot and surrounding farms are not affected by serious flood or drought
	1-2. The counterparts have the capacity to instruct extension workers and incumbent officers on the contents of the technology guidelines prepared by the Project. (see Note 2)	1-2. Examination (see Note 3 for the details), interview	
2. The methods for utilizing livestock resources are verified. (see Note 6 for the details)	2-1. The survival rate of calves in 3 months after birth at the Calf Salvation Center exceeds 90% with the technology for salvaging new born calves.	2-1. Monitoring Survey by the Project	
	2-2. The methods of calf salvation including rearing by farmers are proven to be economically viable.	2-2. Monitoring Survey by the Project	
	2-3. It is confirmed that dry buffaloes are salvaged with improved reproduction technologies.	2-3. Monitoring Survey by the Project	
	2-4. The counterparts have the capacity to promote effective use of livestock resources to the public and private entities according to the guidelines prepared by the Project. (see Note 2)	2-4. Examination (see Note 3 for the details), interview, Case of promotion activities by counterpart	
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts with gender consideration.	3-1. The counterparts, master trainers, and extension workers have a capacity to instruct farmers according to the extension plans and materials prepared by the Project. (see Note 2)	3-1. Examination (see Note 3 for the details), interview	
	3-2. Appropriate technologies are disseminated to about 3,000 (2,000	3-2. Monitoring Survey by	

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
	male and 1,000 female) farmers. 3-3. Effective methods for farmer-to-farmer dissemination of technologies are demonstrated.	the Project 3-3. Case study	
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-1. The annual plan report of the Project is prepared by the initiative of the Department. 4-2. The results of monthly monitoring are reported by the responsible district offices. 4-3. The annual evaluation report of the Project is prepared by the initiative of the Department. 4-4. The Livestock Development Platform is regularly held by the initiative of the Department. 4-5. The Standard Operation Procedures (SOP) is issued by the Department. (see Note 2 and Note 4 for the details)	4-1. Interview to stakeholders 4-2. Monitoring Report 4-3. Interview to stakeholders 4-4. Interview to stakeholders 4-5. SOP	

【Activities and Others】

PDM Ver. 4

Activities	**Inputs**		
	Inputs	**Preconditions**	Necessary inputs for smooth implementation of the Project, such as project fund, counterpart personnel and supporting staff, vehicles, incentives to the staff, etc., are made available timely by the Sindh government.
0. Conduct baseline survey 1-1. Select the pilot farms 1-2. Prepare the technology development plan with the pilot farmers 1-3. Conduct and analyse the on-farm applications at pilot farms 1-4. Prioritize appropriate technologies to be disseminated. 1-5. Monitor and evaluate the application of the identified technologies at farms 1-6. Conduct researches and/or activities with the stakeholders 1-7. Prepare and revise the guideline of technology based on the results	**Japanese Government** 1. Technical experts (1) Team leader/ Institutional development (2) Livestock technology development 1 (3) Livestock technology	PC-1 for the Project is approved by the Pakistan government. Necessary budget is allocated for project implementation. Security situation in the	**Preconditions**

Conduct training on appropriate technologies for incumbent officers and staff (district deputy directors, veterinary officers, para-vets) in the pilot districts 2-1. Select and prepare the Calf Salvation Center 2-2. Examine methods of buffalo calf distribution, dry buffalo distribution, and livestock sharing for dry buffaloes 2-3. Prepare the application plan for utilizing livestock resources. 2-4. Conduct and analyse the applications 2-5. Apply the identified methods to the farmers 2-6. Monitor and evaluate the application of the identified methods 2-7. Prepare the guideline of utilizing livestock resources 3-1. Prepare the extension plan 3-2. Prepare the extension materials 3-3. Conduct trainings for the master trainers and extension workers including women 3-4. Conduct extension activities for farmers 3-5. Monitor and evaluate the extension activities 3-6. Review and revise the extension plan and materials 4-1. Prepare operation guideline for the Project including project management, information sharing, coordination, etc. (see Note 4 for the details) 4-2. Conduct training for project planning, management and monitoring. 4-3. Establish a livestock development platform for coordination and information sharing among stakeholders 4-4. Review and revise the guideline 4-5. Organize training for the establishment of implementation structure for disseminating appropriate technologies in non-pilot districts.	development 2 (4) Livestock feeding management (5) Animal health/ Animal reproduction (6) Livestock extension / Gender (7) Marketing (8) Coordination/Training management 2. Provision of equipment 3. Acceptance of trainees by the Country Specific Training and the Third Country Training	project area does not seriously get worse. Necessary inputs for smooth implementation of the Project, such as project fund, counterpart personnel and supporting staff, vehicles, incentives to the staff, etc., are made available timely by the Sindh government.	PC-1 for the Project is approved by the Pakistan government. Necessary budget is allocated for project implementation. Security situation in the project area does not seriously get worse.

Note 1: The target group is those who rear 1 to 5 cattle/buffaloes regularly, and can be categorized into any of the following:

1. Small scale farmers: Farmers who own more than 2.5 up to 5 acres of land.
2. Marginal scale farmers: Farmers who own up to 2.5 acres of land.
3. Tenants: Farmers who do not own land, but rent land for agriculture.
4. Non-farmers: Persons who work as agricultural labor and who work for non-agriculture activities such as shop keeper, artisan, business, services, etc.

Note 2: The target numbers of the officers and staff who have acquired a capacity according to each guideline are as follows:

Name of guideline	Target officers and staff
Guideline for Appropriate Technology	Eight technical counterparts understand the contents of the Textbook for Appropriate Technology of Dairy Farming to provide instruction as expected.
Guideline for the Methods for Utilizing Livestock Resources	Eight technical counterparts understand the contents of the Guideline for the Methods for Utilizing Livestock Resources to provide instruction as expected.
Extension Guideline	Three extension counterparts, 5 Master Trainers, and 20 extension workers (10 male and 10 female) understand the contents of Extension Guideline to provide instruction as expected.
Operational Guideline for the Project	Sixty % of the participants to SOP trainings understand the contents of the relevant SOP and can prepare it by themselves.

Note 3: The level of acquirement will be measured by examination or other methods to be decided by the Project.

Note 4: One of the purposes to prepare the operation guideline for the Project is to facilitate the application of the guideline of technology, the extension plan and materials prepared by the Project for the entire Department. However, since the Standard Operation Procedures (SOP) needs to be issued by the Department to enforce the entire Department to apply them, its issuance is included in the indicators for the Output 4.

Note 5: The appropriate technologies and management for livestock development consist of the areas of (1) farm management, (2) marketing, (3) feeding management, (4) fodder, (5) reproduction, (6) animal health, and (7) genetic improvement, and refer to “A” rank technologies in the “Appropriate Technology Development Checklist” prepared by the Project.

Note 6: The methods for utilizing livestock resources include salvation of buffalo calves and dry buffaloes, and the salvation of dry buffaloes include livestock sharing.

List of A rank technologies on the “Appropriate Technology Development Checklist”

	Field	Title	Content	Monitoring Indicators
1	Marketing	Production of quality milk	A farmer doesn’t adulterate milk with water.	
2	Feeding Management	(for milking cow) Supply of sufficient water	A milking cow drinks sufficient water.	
3	Feeding Management	Clean water	A water tank is regularly (at least once a week) washed.	✓
4	Feeding Management	(for milking cow) Use of improved tie method	A milking cow is kept by less stressful way.	✓
5	Feeding Management	(for milking cow) Use of simple roof	Simple roof for milking cow has a structure which provides comfortable environment with cool air.	✓
6	Feeding Management	(for milking cow) Dry floor	Floor where milking cows are kept is dried.	✓
7	Feeding Management	(for calf) Proper management of calf at birth	Newly born calf is managed properly.	
8	Feeding Management	(for calf) Provision of colostrum to calf at birth	Colostrum is given to calf within 6 hours after birth.	✓
9	Feeding Management	(for calf) Prevention management against heat	A calf under age of 3 months is kept in shade and is showered or water-sprayed to lower its body surface temperature.	✓
10	Feeding Management	Cow management at parturition	A cow is delivered at comfortable space and immediately treated.	
11	Feeding Management	(for buffalo) Bathing/shower	A buffalo is bathed or showered during hot season.	
12	Feeding Management	(for milking cow) Hoof-cutting	A cow at least one year gets hoof-cutting.	
13	Feeding Management	(for milking cow) Body Condition Score “BCS”	A farmer judges milking cow’s body condition by BCS.	✓
14	Feeding Management	(for calf) Nutrition diagnosis	A farmer diagnoses nutrition level of his/her calf.	
15	Fodder	Cleaning of feed trough	Leftover in feed trough is thrown away so that cattle can always eat new fodder.	✓
16	Fodder	(for calf) Hay making	A farmer provides enough and good quality of dry fodder to calf.	✓
17	Reproduction	Heat detection	For heat detection, a farmer observes cow’s condition before bedtime, such as mucus, bellowing and milk production volume.	
18	Genetic Improvement	Identification of good bull	Ability of a breeding bull which is used for mating is confirmed	
19	Genetic Improvement	Identification of good cow	Ability of a cow is confirmed	

Attachment 2-1 WBS: Detailed Activity Plan and Progress for the First Year

The following shows the detail Plan of Operations of the first year; the plan shown in the work plan and the progress by the end of January 2015.

Outputs	Activities		Expected Results	2014 FY25 1st Year 2	3	4	5	6	7	8	9	10	11	12	2015 1	2	Responsible Person	Implementers	Major equipment and facilities	Remarks
0. Project plan is developed, and implementation structure is organized.	0-1. Develop a work plan draft (in Japan)	0-1-1. Develop a work plan (in Japanese) (Including PDM ver.0)	The draft of work plan(in Japanese)														Okabe	Okabe, Ikegaya, Tominaga		
		0-1-2. Discuss with JICA and finalize the work plan (in Japanese)	The work plan final(in Japanese)														Okabe	Okabe		
		0-1-3. Develop a work plan (in English) (Including PDM ver.0)	The first draft of work plan (in English) (Including PDM ver.0)														Okabe	Okabe, Ikegaya, Tominaga, Ryu		
	0-2. Kick off project activities	0-2-1. Open the project office	Start of work at the project office														Okabe	Okabe, Ikegaya, Tominaga, Ryu		
		0-2-2. Conduct a kick-off meeting to explain the draft of work plan, discuss, and reach a consensus	The second draft of work plan														Okabe	Okabe, Ikegaya, Tominaga, Ryu		
	0-3.Conduct the baseline survey	0-3-1. Prepare a survey plan	TOR of the sub-contracted survey														Ikegaya	Okabe, Ikegaya, Tominaga		
		0-3-2. Develop a questionnaire draft	The questionnaire draft														Ikegaya	Okabe, Ikegaya, Tominaga		
		0-3-3. Select and conclude contract with a local survey company to be entrusted	The contract with the local survey company														Ikegaya	Okabe, Ikegaya		
		0-3-4. Develop a detailed activity plan with the survey company	The detailed activity plan														Ikegaya	Ikegaya		
		0-3-5. Train field surveyors of the survey company	Deepened understanding of the field surveyors on survey method/contents														Ikegaya	Ikegaya		
		0-3-6. Finalize the questionnaire through field test	Finalized questionnaire														Ikegaya	Ikegaya		
		0-3-7. Conduct monitoring of the survey by the company	Progress of the survey as planned														Ikegaya	Ikegaya		
		0-3-8. Receive the baseline survey result and share it among the Project Team	The baseline survey report														Ikegaya	Okabe, Ikegaya, Tominaga, Ryu, Hara		
		0-3-9. Develop an Appropriate Technology Development Checklist	The Appropriate Technology Development Checklist														Okabe	Okabe, Ikegaya, Tominaga, Ryu, Hara		
	0-4. Finalize the work plan	0-4-1. Decide the venue, participants and agenda of the Steering Committee meeting	The Steering committee meeting program draft (Venue, participant list and agenda)														Okabe	Okabe		

Outputs	Activities		Expected Results	2014											2015		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY25					FY26											
				Ist Year																
				2	3	4	5	6	7	8	9	10	11	12	1	2				
0. Project plan is developed, and implementation structure is organized.	0-4. Finalize the work plan	0-4-2. Hold a consultation meeting with Livestock Department representatives (DG and directors) to explain the agenda of the S/C meeting, discuss and reach a consensus	Deepened understanding of the Livestock Department representatives on the Project														Okabe	Okabe		
		0-4-3. Prepare presentation materials	Presentation materials														Okabe, Tominaga	Okabe, Tominaga		
		0-4-4. Hold the S/C meeting	The meeting minutes, approval of the work plan														Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Ryu, Hara		
		0-4-5. Revise PDM ver.0 to develop PDM ver.1(draft) based on the results of the baseline survey and the S/C meeting	PDM ver.1(draft)														Okabe	Okabe, Tominaga		
		0-4-6. Finalize PDM ver.1 draft through discussion with C/P and JICA	Finalized PDM ver.1														Okabe	Okabe		
		0-4-7. Finalize the work plan	Finalized work plan														Okabe	Okabe		
	0-5. Develop the project PR materials	0-5-1. Develop a project leaflet draft (Japanese)	The project leaflet draft (Japanese)														Ikegaya	Okabe, Ikegaya		
		0-5-2. Discuss with JICA and finalize the project leaflet draft	The project leaflet final (Japanese)														Ikegaya	Okabe, Ikegaya		
		0-5-3. Develop the project leaflet in English and Sindh	The project leaflet final (English and Sindh)														Ikegaya	Ikegaya		
	0-6. Conduct the third country training in India	0-6-1. Develop a tentative study tour plan in India	The tentative study tour plan in India														Ikegaya	Ikegaya, Tominaga		
		0-6-2. Discuss with JICA and finalize the tentative study tour plan in India	The final study tour plan in India														Ikegaya	Ikegaya, Tominaga		
		0-6-3. Conduct the study tour in India	The study tour in India														Ikegaya	Ikegaya, Tominaga, Hara		
		0-6-4. Based on the study tour in India, develop a tentative training plan in India	The tentative training plan in India														Ikegaya	Ikegaya, Tominaga		
	0-7. Conduct the training in Japan	(No activity)																		
	0-8. Develop the 2nd year work plan draft	0-8-1. Together with C/P, evaluate the activities in the 1st year	The result of the evaluation workshop for the 1st year														Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-8-2. Discuss with C/P about the work plan draft for the 2nd year	The first draft of the 2nd year work plan														Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-8-3. Based on the discussion, modify the PDM ver.1 and develop the PDM ver.2 (draft)	The PDM ver.2 (draft)														Okabe	Okabe, Tominaga		

Outputs	Activities		Expected Results	2014												2015		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY25							FY26										
				Ist Year																	
				2	3	4	5	6	7	8	9	10	11	12	1	2					
0. Project plan is developed, and implementation structure is organized.	0-9. Develop the progress report	0-9-1. Based on the results of above activities, develop the draft of the progress report (Japanese and English)	The draft of the progress report															Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-9-2. Discuss with JICA and finalize the progress report	The progress report final															Okabe	Okabe, Ikegaya, Tominaga		
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-1. Select the Pilot Farms	1-1-1. Organize kick-off meeting with Livestock district concerned officers, counterparts as well as national staff to agree on the selection of pilot farms and overall framework of the actitites.	Draft activity plan of pilot farms, a list of focal persons															Tominaga	Tominaga, Ikegaya, Ryu		
		1- 1 -2. Conduct field test for selection of pilot farms.	Questionnaire form for pilot farms															Tominaga	Tominaga, Ryu		
		1-1-3. Conduct questionnaire survey of candidate pilot villages to select pilot villages.	List of candidate pilot villages, Questionnaire form for villages, List of pilot villages															Tominaga	Tominaga, Kawamoto, Ryu, Hara		
		1-1-4. Identify candidate pilot farms in pilot villages and conduct questinnaire survey.	List of candidate pilot farms, Data of candidate pilot farms															Tominaga	Tominaga, Kawamoto, Hara		
		1-1-5. Make database of candidate pilot farms and score data for evaluation. Select 2 candidate for each one pilot farm.	Table of score of pilot farms, List of 2 candidate pilot farms for each pilot farm															Tominaga	Tominaga, Kawamoto, Ryu, Hara		
		1-1-6. Make final selection of pilot farms.	Questionaire for final candidate pilot farms, Data, List of Pilot farms															Tominaga	Tominaga, Kawamoto, Ryu, Hara		
	1-2. Prepare the technology development plan with pilot farmers	1-2-1. Visit pilot farms by a group of 2 members of C/P to grasp situation of pilot farms.	Format for recording pilot farm data, data of pilot farms															Tominaga	Tominaga		
		1-2-2. Draft development plan.	Draft activity plan of each specialized field															Tominaga	Tominaga, Hara		
		1-2-3. Visit pilot farms to exchange opinion and draft appropriate technology development plan.	Table of weekly interview and monthly measurement day, Plan of appropriate technology development for the 1st year															Tominaga	Tominaga, Hara		
	1-3 Conduct and analyse the on-farm application at pilot farms	1-3-1. Conduct weekly interview and monthly measurement at pilot farms.	Weekly interview format, Monthly measurement recording format, Basic Data															Tominaga	Tominaga, Ikegaya, Sugiwaka, Kobayashi, Hara		
		1-3-2. Organize a study tour for pilot farms.	List of approparite technology, plan for establishment of appropriate technology															Tominaga	Tominaga, Hara		
		1-3-3. Grasp current farm management of pilot farms and give technical guidance to them.	Weekly farm management data, Monthly animalinventory data, Draft model of farm management															Tominaga	Tominaga, Hara		

Outputs	Activities		Expected Results	2014											2015		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY25	FY26															
				Ist Year																
				2	3	4	5	6	7	8	9	10	11	12	1	2				
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-3 Conduct and analyse the on-farm application at pilot farms	1-3-4. Monitor distribution channel and price of animal products in and surrounding pilot farms to propose alternative marketing models.	Monthly data of price of animal products, Model for increasing price of animal products									■	■	■	■	■	Tominaga	Tominaga, Ikegaya, Hara		
		1-3-5. Devise the system for collecting, accumulating and disseminating market information in the livestock department	Market information collected, System for disseminating market information														Tominaga	Tominaga, Ikegaya, Hara		
		1-3-6. Install animal management facilities to prove animal management techniques and monitor outcomes.	Drawing for iron pipe race, Model race facilities, Drawing for wooden animal management frame facilities, Model wooden animal management frame facilities								■	■	■	■	■	■	Tominaga	Tominaga, Kawaomto, Hara	Iron pipe, welding rods, and hinges for steel pipe race, Wood pieces, wood plate, nails, concrete blocks for wooden animal management frame faciities	Finalization of installation place, Dratging drawings, Procurement of materials
		1-3-7. Give technical guidance to increase milk production at pilot farms.	Drawing for basic milking shed and paddock, Model basic milking shed and paddock facilities, draft plan of mixed concentrate feed									■	■	■	■	■	Tominaga	Tominaga, Sugiwaka, Kobayashi, Hara	Logs, Bamboos, Nails, Wooden door, Bricks	Finalization of installation place, Drafting drawings, Procurement of materials
		1-3-8. Develop efficient animal management systems and facilities to reduce physical environment stress of animals.	Model facilities for shade, wind protection, ventilation, water trough, feed trough, hoof cutting, etc.									■	■	■	■	■	Tominaga	Tominaga, Sugiwaka, Kobayashi, Hara	Wood materials, Paints, Plastic sheet, Oil drum, Hoof cutter	
		1-3-9. Develop appropriate feed model by calculating nutritious requirement of each type of animals and stage of growing. Utilize locally available feed.	Table of ingredients, model for feed				■	■	■	■	■	■	■	■	■	■	Tominaga	Tominaga, Sugiwaka, Kobayashi, Hara	Ph meter, Spectrophoto meter, Nitrogen Analyzer, Cutting mill	Request for analysis of fodder to PCSIR and laboratory of Livestock Department in Karachi, Evaluation of analysis results
		1-3-10. Survey nutritious value and micro mineral in the soil to study it's impact on feeds. Give technical guidance to pilot farms about appropriate feed.	Soil analysis table, Draft technical gidance plan for feed				■	■	■	■	■	■	■	■	■	■	Tominaga	Tominaga, Sugiwaka, Kobayashi, Hara		
		1-3-11. Study shortage of roughage supply during preharvest periods to give appropriate techical guidance on feed storage. Give technical guidance how to increase production of roughage.	Draft plan for hay preparation formula, Draft plan for fermenting rice straw with ammonia, Draft plan for growing feed plants														Tominaga	Tominaga, Kobayashi, Hara		
		1-3-12. Conduct training on reproductive disorder diagnosis and treatment to improve conception rate of female animals.	Reproduction diagnosis card, Draft plan for training on reproductive disorder								■	■	■	■	■	■	Tominaga	Tominaga, Ono, Hara	Animal Reproductive Organ	Visit to candidate place for training on animal reproduction
		1-3-13. Conduct training on andrology reproductive function diagnosis to improve reproductive rate of male animals.	Plan for inviting experts from 3rd country														Tominaga	Tominaga, Hara		
		1-3-14. Conduct joint research on reproductive psysiology of Khundi buffalo and Zebu with Sindh Agriculture University Tandojam (and others) to develop guideline for increasing conception rate. Carry out small scale pilot AI.	List of persons in charge, Draft plan for reproductive psysiology survey														Tominaga	Tominaga, Hara		

Outputs	Activities		Expected Results	2014												2015		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY25						FY26											
				Ist Year																	
				2	3	4	5	6	7	8	9	10	11	12	1	2					
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-3 Conduct and analyse the on-farm application at pilot farms	1-3-15. Sensitize and give technical guidance on preventive animal health. Grasp the curent situation on brucellosis and tuberculosis to examine appropriate measure to be taken.	Draft plan for vaccination and deworming, Disease diagnosis card, Draft plan of mastitis measure, Draft plan for brucellosis and tuberculosis															Tominaga	Tominaga, Ono, Hara		
		1-3-16. Introduce elite breeding bull into pilot villages on trial basis and establish model for genetic improvement.	Plan for milk test, List of buffalo with which milk test to be performed															Tominaga	Tominaga, Nagamine, Chiba, Hara		
		1-3-17. Establish pedigree registration model for Khundi buffalo.	Draft plan for pedigree registration, Draft plan for pedigree registration management software, List of registered buffalo															Tominaga	Tominaga, Chiba, Hara		
	1-4 Apply the identified technologies to the surrounding farms	Refer to Activity 3-4																			
	1-5 Monitor and evaluate the application of the identified technologies at farms	Refer to Activity 3-5																			
	1-6. Conduct researches and/or activities with the stakeholders	1-6-1.Conduct activities related to feed, genetic improvement and reproduction in collaboration with Sindh Agriculture University Tandojam.	Draft activity plan															Tominaga, Hara	Tominaga, Kobayashi, Ono, Nagamine, Chiba, Hara		
		1-6-2.Carry out activities in collaboration with Engro Fertilizer Ltd.	Draft activity plan															Tominaga, Hara	Tominaga, Kobayashi, Hara		
		1-6-3. Carry out activities with other related organization.	Draft activity plan															Tominaga, Hara	Tominaga, Hara		
	1-7. Prepare the guideline of technology	1-7-1. Complie case study of established technology. Collect related information and data.	List of information collected, Data collected															Tominaga, Hara	All technical experts		
		1-7-2. Develop manual for technicians.	Manual for technicians of each field															Tominaga, Hara	All technical experts		
		1-7-3. Develop manual for famers.	Manual for farmers of each field															Tominaga, Hara	All technical experts		
2. The methods for utilizing livestock resources are verified. (Note: The methods for utilizing livestock resources include salvation of buffalo calves, recycling of dry buffaloes, livestock sharing and livestock revolving.)	2-1. Select and prepare the experimental farms	2-1-1. Identify the place for the experimental farm.	List of candidate places, Comparison sheet for evaluation															Tominaga	Tominaga, Kawamoto, Ryu		
		2-1-2. Equip appropriate facilities in the experimental farm.	Plan of facilities (Wire fence for quarantine, Basic tent warehouse, Paddock for group feeding), Drawing of facilities, Model facilities															Tominaga, Hara	Tominaga, Kawamoto, Hara	Electric Wiring, Plumbing	
		2-1-3. Equip appropriate equipment and materials in the experiental farm.	Plan for equipment and materials (Calf hatch, Rack for hey, Hook for feed trough and water trough, Disinfection box, Feed mixing box), Drawing of equipment, Proto-type equipment															Tominaga, Hara	Tominaga, Sugiwaka, Hara		

Outputs	Activities		Expected Results	2014												2015		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY25			FY26														
				Ist Year																	
				2	3	4	5	6	7	8	9	10	11	12	1	2					
2. The methods for utilizing livestock resources are verified. (Note: The methods for utilizing livestock resources include salvation of buffalo calves, recycling of dry buffaloes, livestock sharing and livestock revolving.)	2-1. Select and prepare the experimental farms	2-1-4. Set up calf management system and deploy necessary staff.	Plan for calf management, Recording format, Plan for deployment of staff															Tominaga, Hara	Tominaga, Sugiwaka, Hara	Equipment related to animal hygiene, Feeding equipment, Basic beds	
		2-1-5. Make preparation for introducing calves to the experimantal farm.	List of farms who provide calves, Plan for introducing calves															Tominaga, Hara	Tominaga, Sugiwaka, Hara		
		2-1-6. Introduce calves into the experimental farm. Try various feeding method to compile results of them.	Plan for feeding management, Plan for health and hygiene management, reports															Tominaga, Hara	Tominaga, Sugiwaka, Hara		
	2-2. Examine methods of buffalo calf distribution, dry buffalo recycling and livestock sharing and revolving	2-2-1. Distribute calves on trial basis. Give technical guidance and monitor them to compile results.	Questionnaire for farmers who received calves, Plan for distribution of calves, Plan for monitoring															Tominaga, Hara	All technical experts		
		2-2-2. Examine recycling and sharing methods practiced at cattle colonies and farmers.	Survey plan															Tominaga, Hara	All technical experts		
		2-2-3. Examine microcredit, other financial resources and other related organizations.	Survey plan															Ikegaya	All technical experts		
	2-3. Prepare the application plan for utilizing livestock resources	2-3-1. Compile plan for utilizing calves.	Plan for distributing calves															Tominaga, Hara	All technical experts		
		2-3-2. Compile plan for utilizing dry buffalo.	Plan for utilization of dry buffalo															Tominaga, Hara	All technical experts		
	2-4. Conduct and analyse the applications	2-4-1. Prepare a pilot plan for utilizing calves and evalluate the results.	Plan for piloting calf utilization plan															Tominaga, Hara	All technical experts		
		2-4-2. Prepare a pilot plan for utilizing dry buffalo and evaluate the results.	Plan for piloting dry buffalo utilization plan															Tominaga, Hara	All technical experts		
	2-5. Apply the identified methods to the farmers	2-5-1. Apply calf utilization plan to the farmers.	Draft application plan for calves															Tominaga, Hara	Tominaga, Ikegaya, Kawamoto, Hara		
		2-5-2.Apply dry buffalo utilization plan to the farmers.	Draft application plan for dry buffalo															Tominaga, Hara	Tominaga, Ikegaya, Kawamoto, Hara		
	2-6. Monitor and evaluate the application of the identified methods	2-6-1. Compile the result of application of calf utilization method at farmers.	Report on survey of farmers (Utilization of livestock assets)															Tominaga, Hara	Tominaga, Kawamoto, Hara		
		2-6-2. Compile the result of application of dry buffalo utilization method at farmers.	Report on survey of farmers (Utilization of livestock assets)															Tominaga, Hara	Tominaga, Kawamoto, Hara		
	2-7. Prepare the guideline of utilizing livestock resources	2-7-1. Compile the guideline for calf utilization methods.	Draft guideline															Tominaga, Hara	All technical experts		
		2-7-2.Compile the guideline for dry buffalo utilization methods.	Draft guideline															Tominaga, Hara	All technical experts		
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts.	3-1. Prepare the extension plan	3-1-1. Explain the extension structure developed at the Master Plan to C/P	Deepened understanding of C/P on extension structure															Okabe	Okabe		
		3-1-2. Conduct a Participatory Rural Appraisal survey at pilot villages	Deepened understanding of the Project team on rural social structure, information flow and decision-making process															Okabe	Okabe, Kawamoto		

Outputs	Activities		Expected Results	2014											2015		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY25			FY26													
				Ist Year																
				2	3	4	5	6	7	8	9	10	11	12	1	2				
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts.	3-2. Prepare the extension materials	3-2-1. Conduct interview surveys to extension-related institutions in Sindh province	Existing extension materials collected, possibility of collaboration with potentially available human resources for extension surveyed, deepened understanding of the Project Team on possible obstacles against extension activities										■				Kawamoto	Kawamoto		
	3-3. Conduct trainings for the master trainers and extension workers including women	3-3-1. Support the development of the recruitment policy of the Livestock Department on C/P for gender, social mobilization, and the Master Trainers	The recruitment policy adopted									■	■				Okabe	Okabe		
		3-3-2. Support the development of recruitment examamination	The recruitment examination										■				Okabe	Okabe		
		3-3-3. Hold recruitment exam (written test and interview test)	The exam result											■			Tominaga	Tominaga, Hara		
		3-3-4. Support the development of a recruitment criteria	The recruitment criteria adopted											■			Tominaga	Tominaga, Hara		
	3-4. Conduct extension activities for farmers	(No activity)																		
	3-5. Monitor and evaluate the extension activities	(No activity)																		
	3-6. Review and revise the extension plan and materials	(No activity)																		
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-1. Prepare operation guidelines for the Project including project management, information sharing, coordination, etc.	4-1-1. Prepare the draft of operation guidelines for the Project	The first draft of operation guidelines				■	■	■	■	■	■	■	■	■		Okabe	Okabe		
	4-2. Conduct training for project planning, management and monitoring	4-2-1. Prepare a questionnaire for the Training Needs Assessment for the Livestock Department officers	The questionnaire for the Training Needs Assessment				■										Okabe	Okabe		
		4-2-2. Conduct the Training Needs Assessment	The result of the Training Needs Assessment				■										Okabe	Sarwar		
		4-2-3. Select candidate training institutes to be sub-contracted and send a request for proposal submission	The list of candidate training institutes to be sub-contracted, receipt of proposals							■							Okabe	Okabe, Ryu		
		4-2-4. Prepare a proposal assessment criteria	The proposal assessment criteria							■							Okabe	Okabe, Ryu		
		4-2-5. Prepare drafts of contract, TOR, and a training evaluation sheet	The draft of contract etc.							■							Okabe	Okabe, Ryu		

Outputs	Activities		Expected Results	2014											2015		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY25			FY26													
				Ist Year																
				2	3	4	5	6	7	8	9	10	11	12	1	2				
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-2. Conduct training for project planning, management and monitoring	4-2-6. Assess the proposals submitted and select a training institute for sub-contract	The training institute selected for sub-contract								■						Okabe	Okabe, Ryu		
		4-2-7. Hold a contract negotiation with the training institute	Conclusion of the contract								■						Okabe	Okabe, Ryu		
		4-2-8. Check the detailed training work plan submitted by the sub-contracted training institute	The draft of training work plan									■					Okabe	Okabe, Ryu		
		4-2-9. Finalize the participants of the training based on the candidate list submitted by the Livestock Department	The participant list for the training									■					Okabe	Okabe		
		4-2-10. Finalize the drafts of contract, TOR and work plan through discussion with the sub-contracted training institute and conclude the contract	The finalized contract, TOR and the work plan									■					Okabe	Okabe, Ryu		
		4-2-11. Discuss with the JICA Non-formal Education Promotion Project to finalize training contents to be entrusted	MOU								■	■					Okabe	Okabe, Ryu		
		4-2-12. Conduct training	Pre test, post test							■	■	■	■	■	■		Okabe	Okabe, Ryu		
		4-2-13. Compile the feedback from the participants	The training feedback result										■				Ryu	Ryu		
		4-2-14. Discuss with the sub-contracted training institute at a wrap up meeting about the lessons learnt and points to improve for the next year planning	The lessons learnt and points to improve										■				Okabe	Okabe, Ryu		
	4-3. Establish a livestock development platform for coordination and information sharing among stakeholders	4-3-1. Confirm the venue, participants, and the agenda of the livestock development platform	The livestock development platform program draft (the venue, the invitation list, and the agenda)				■	■	■	■					■		Okabe	Okabe		
		4-3-2. Hold a consultation meeting with the livestock department represntatives (DG, directors) to explain, discuss and reach a consensus about the livestock development platform contents	Deepened understanding of the Livestock Department representatives on the Project contents												■		Sarwar	Sarwar		
		4-3-3. Hold the livestock development platform	The livestock development platform participant list, the meeting minutes												■		Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		4-3-4. Reflect the result of the meeting into the next year activity plan	Reflection to the progress report												■		Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		

Outputs	Activities		Expected Results	2014											2015		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY25	FY26															
				Ist Year																
				2	3	4	5	6	7	8	9	10	11	12	1	2				
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-4. Review and revise the guideline	4-4-1. Hold a consultation meeting with the livestock department representatives (DG, directors) based on the outcome of the training and the platform meeting to explain, discuss and reach a consensus about establishing the task forces in charge of the development and revision of operation guideline	The first draft of the task force												■		Okabe	Okabe		

■ :Plan indicated in the Work Plan ■ : Progress

Attachment 2-2 WBS: Detailed Activity Plan and Progress the Second Year

Outputs	Activities		Expected Results	2015 FY26 2nd Year 2	3	4	5	6	7	8	9	10	11	12	2016 FY27 1	2	Responsible Person	Implementers	Major equipment and facilities	Remarks
0. Project plan is developed, and implementation structure is organized.	0-1. Develop a work plan draft (in Japan)	0-1-1. Develop a work plan (in Japanese) (Including PDM ver.2 draft)	The draft of work plan(in Japanese)														Okabe	Okabe, Ikegaya, Tominaga		(No PDM revision)
		0-1-2. Discuss with JICA and finalize the work plan (in Japanese)	The work plan final(in Japanese)														Okabe	Okabe		
		0-1-3. Develop a work plan (in English) (Including PDM ver.2 draft)	The first draft of work plan (in English)														Okabe	Okabe, Ikegaya, Tominaga, Ryu		(No PDM revision)
	0-2. Kick off project activities	0-2-1. Open the project office	Start of work at the project office																	(completed in the 1st year)
		0-2-2. Conduct a kick-off meeting to explain the draft of work plan, discuss, and reach a consensus	The second draft of work plan														Okabe	Okabe, Ikegaya, Tominaga, Ryu		
	0-3.Conduct the baseline survey	–	Baseline survey report, Appropriate Technology Development Checklist																	(completed in the 1st year)
	0-4. Finalize the work plan	0-4-1. Decide the venue, participants and agenda of the Steering Committee meeting	The Steering committee meeting program draft (Venue, participant list and agenda)														Okabe	Okabe		
		0-4-2. Hold a consultation meeting with Livestock Department representatives (DG and directors) to explain the agenda of the S/C meeting, discuss and reach a consensus	Deepened understanding of the Livestock Department representatives on the Project														Okabe	Okabe		
		0-4-3. Prepare presentation materials	Presentation materials														Okabe, Tominaga	Okabe, Tominaga		
		0-4-4. Hold the S/C meeting	The meeting minutes, approval of the work plan														Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Ryu, Hara		
		0-4-5. Revise PDM ver.2 draft based on the results of the S/C meeting	PDM ver.2 (revised)														Okabe	Okabe, Tominaga		(No PDM revision)
		0-4-6. Finalize PDM ver.2 draft through discussion with C/P and JICA	Finalized PDM ver.2														Okabe	Okabe		(No PDM revision)
		0-4-7. Finalize the work plan	Finalized work plan														Okabe	Okabe		
	0-5. Develop the project PR materials	–	Project leaflet (Japanese, English, Sindh)																	(completed in the 1st year)
		0-5-4. By assisting the construction of the website for the Livestock Department, upload the project information	Website														Okabe	Okabe, Ryu		(No progress)
	0-6. Conduct the third country training in India	0-6-1. Develop a tentative study tour plan in India	The tentative study tour plan in India														Ikegaya	Ikegaya, Tominaga		
		0-6-2. Discuss with JICA and finalize the tentative study tour plan in India	The final study tour plan in India														Ikegaya	Ikegaya, Tominaga		
		0-6-3. Conduct the study tour in India	The study tour in India														Ikegaya	Ikegaya, Tominaga, Hara		
		0-6-4. Based on the study tour in India, develop a tentative training plan in India	The tentative training plan in India														Ikegaya	Ikegaya, Tominaga		
	0-7. Conduct the training in Japan	0-7-1. Develop a training plan in Japan	Training plan in Japan														Tominaga	Tominaga, Ryu		
		0-7-2. Conduct a training in Japan	Training conducted														Ryu	Tominaga, Ryu		

:Plan indicated in the Work Plan : Progress

Outputs	Activities		Expected Results	2015											2016		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY26		FY27														
				2nd Year																
				2	3	4	5	6	7	8	9	10	11	12	1	2				
0. Project plan is developed, and implementation structure is organized.	0-8. Develop the 3rd year work plan draft	0-8-1. Together with C/P, evaluate the activities in the 2nd year	The result of the evaluation workshop for the 2nd year														Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-8-2. Discuss with C/P about the work plan draft for the 3rd year	The first draft of the 3rd year work plan														Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-8-3. Based on the discussion, modify the PDM ver.2 and develop the PDM ver.3 (draft)	The PDM ver.3 (draft)														Okabe	Okabe, Tominaga		(No PDM revision)
	0-9. Develop the progress report	0-9-1. Based on the results of above activities, develop the draft of the progress report (Japanese and English)	The draft of the progress report														Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-9-2. Discuss with JICA and finalize the progress report	The progress report final														Okabe	Okabe, Ikegaya, Tominaga		
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-1. Select the Pilot Farms	-	Draft activity plan of pilot farms, Questionnaire																	(completed in the 1st year)
		1-1-3. Conduct questionnaire survey of candidate pilot villages to select pilot villages.	List of candidate pilot villages, Questionnaire form for villages, List of pilot villages														Tominaga	Tominaga, Kawamoto, Ryu, Hara		
		1-1-4. Identify candidate pilot farms in pilot villages and conduct questionnaire survey.	List of candidate pilot farms, Data of candidate pilot farms														Tominaga	Tominaga, Kawamoto, Hara		
		1-1-5. Make database of candidate pilot farms and score data for evaluation. Select 2 candidate pilot farms for each one pilot farm.	Table of score of pilot farms, List of 2 candidate pilot farms for each pilot farm														Tominaga	Tominaga, Kawamoto, Ryu, Hara		
		1-1-6. Make final selection of pilot farms.	Questionnaire for final candidate pilot farms, Data, List of Pilot farms														Tominaga	Tominaga, Kawamoto, Ryu,		
	1-2. Prepare the technology development plan with pilot farmers	1-2-1. Visit pilot farms by a group of 2 members of C/P to grasp situation of pilot farms.	Format for recording pilot farm data, data of pilot farms														Tominaga	Tominaga		
		1-2-2. Draft development plan.	Draft activity plan of each specialized field														Tominaga	Tominaga, Hara		
		1-2-3. Visit pilot farms to exchange opinion and draft appropriate technology development plan.	Table of weekly interview and monthly measurement day, Plan of appropriate technology for the 1st year														Tominaga	Tominaga, Hara		
	1-3 Conduct and analyse the on-farm application at pilot farms	1-3-1. Conduct weekly interview and monthly measurement at pilot farms.	Weekly interview format, Monthly measurement recording format, Basic Data														Tominaga	Tominaga, Ikegaya, Sugiwaka, Kobayashi, Hara		
		1-3-2. Organize a study tour for pilot farms.	List of appropriate technology, plan for establishment of appropriate technology														Tominaga	Tominaga, Hara		(No progress)
		1-3-3. Grasp current farm management of pilot farms and give technical guidance to them.	Weekly farm management data, Monthly animal inventory data, Draft model of farm management														Tominaga	Tominaga, Hara		
		1-3-4. Monitor distribution channel and price of animal products in and surrounding pilot farms to propose alternative marketing models. Conduct pilot activities including market survey by farmers, household budget making, collaboration with private companies.	Monthly data of price of animal products, Model for increasing price of animal products, Model for selling animal products, Draft technical guideline for marketing, Draft extension materials														Tominaga	Tominaga, Ikegaya, Hara		
		1-3-5. Devise the system for collecting, accumulating and disseminating market information in the livestock department	Market information collected, System for disseminating market information														Tominaga	Tominaga, Ikegaya, Hara		

:Plan indicated in the Work Plan : Progress

Outputs	Activities		Expected Results	2015											2016	Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY26					FY27										
				2nd Year															
				2	3	4	5	6	7	8	9	10	11	12	1	2				
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-3 Conduct and analyse the on-farm application at pilot farms	1-3-6. Install animal management facilities to prove animal management techniques and monitor outcomes.	Drawing for iron pipe race, Model race facilities, Drawing for wooden animal management frame facilities, Model wooden animal management frame facilities														Tominaga	Tominaga, Kawamoto, Hara	Iron pipe, welding rods and hinges for steel pipe race, Wood pieces, wood plate, nails, concrete blocks for wooden animal management frame facilities	Finalization of installation place, Drafting drawings, Procurement of materials
		1-3-7. Give technical guidance to increase milk production at pilot farms.	Drawing for basic milking shed and paddock, Model basic milking shed and paddock, draft formula plan of mixed concentrate feed														Tominaga	Tominaga, Sugiwaka, Kobayashi, Hara	Logs, Bamboos, Nails, Wooden door, Bricks	Finalization of installation place, Drafting drawings, Procurement of materials
		1-3-8. Develop efficient animal management systems and facilities to reduce physical environment stress of animals.	Model facilities for shade, wind protection, ventilation, water trough, feed trough, hoof cutting etc.														Tominaga	Tominaga, Sugiwaka, Kobayashi, Hara	Wood materials, Paints, Plastic sheet, Oil drum, Hoof cutter	
		1-3-9. Develop appropriate feed model by calculating nutritious requirement of each type of animals and stage of growing. Utilize locally available feed.	Table of ingredients, model for feed														Tominaga	Tominaga, Sugiwaka, Kobayashi, Hara	PH meter, Spectrophoto meter, Nitrogen Analyzer, Cutting mill	Request for analysis of fodder to PCSIR and laboratory of Livestock Department in Karachi, Evaluation of analysis results (No progress)
		1-3-10. Survey nutritious value and micro mineral in the soil to study it's impact on feeds. Give technical guidance to pilot farmers about appropriate feed.	Soil analysis table, Draft technical guidance plan for feed														Tominaga	Tominaga, Sugiwaka, Kobayashi, Hara		(No progress)
		1-3-11. Study shortage of roughage supply during preharvest periods to give appropriate technical guidance on feed storage. Give technical guidance how to increase production of roughage.	Draft plan for hay preparation formula, Draft plan for fermenting rice straw with ammonia, Draft plan for growing feed plants														Tominaga	Tominaga, Kobayashi, Hara		
		1-3-12. Conduct training on reproductive disorder diagnosis and treatment to improve conception rate of female animals.	Reproduction diagnosis card, Draft plan for training on reproductive disorder														Tominaga	Tominaga, Ono, Hara	Animal Reproductive Organ	Visit to candidate place for training on animal reproduction
		1-3-13. Conduct training on andrology reproductive function diagnosis to improve reproductive rate of male animals.	Plan for inviting experts from 3rd country														Tominaga	Tominaga, Hara		
		1-3-14. Conduct joint research on reproductive physiology of Khundi buffalo and Zebu with Sindh Agriculture University Tandojam (and other) to develop guideline for increasing conception rate. Carry out small scale pilot AI.	List of persons in charge, Draft plan for reproductive physiology survey														Tominaga	Tominaga, Hara		
		1-3-15. Sensitize and give technical guidance on preventive animal health. Grasp the current situation on brucellosis and tuberculosis to examine appropriate measure to be taken.	Draft plan for vaccination and deworming, Disease diagnosis card, Draft plan of mastitis measure, Draft plan for brucellosis and tuberculosis														Tominaga	Tominaga, Ono, Hara		
		1-3-16. Introduce elite breeding bull into pilot villages on trial basis and establish model for genetic improvement.	Plan for milk test, List of buffalo with which milk test to be performed.														Tominaga	Tominaga, Nagamine, Chiba, Hara		(No progress)
		1-3-17. Establish pedigree registration model for Khundi buffalo.	Draft plan for pedigree registration, Draft plan for pedigree registration, List of registered buffalo.														Tominaga	Tominaga, Chiba, Hara		
	1-4 Apply the identified technologies to the surrounding farms	Refer to Activity 3-4																		

:Plan indicated in the Work Plan : Progress

Outputs	Activities		Expected Results	2015											2016		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY26						FY27										
				2nd Year																
				2	3	4	5	6	7	8	9	10	11	12	1	2				
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-5 Monitor and evaluate the application of the identified technologies at farms	Refer to Activity 3-4																		
	1-6. Conduct researches and/or activities with the stakeholders	1-6-1.Conduct activities related to feed, genetic improvement and reproduction in collaboration with Sindh Agriculture University, Tandojam	Draft activity plan, Reports														Tominaga, Hara	Tominaga, Kobayashi, Ono, Nagamine, Chiba		
		1-6-2.Carry out activities in collaboration with Engro Fertilizer Ltd.	Draft activity plan														Tominaga, Hara	Tominaga, Kobayashi, Hara		
		1-6-3. Carry out activities with other related organization.	Draft activity plan														Tominaga, Hara	Tominaga, Hara		
	1-7. Prepare the guideline of technology	1-7-1. Compile case study of established technology. Collect related information and data.	List of information collected, Data collected														Tominaga, Kawamoto, Hara	All technical experts		
		1-7-2. Develop manual for technicians.	Manual for technicians of each field														Tominaga, Kawamoto, Hara	All technical experts		
		1-7-3. Develop manual for farmers.	Manual for farmers of each field														Tominaga, Kawamoto, Hara	All technical experts		
2. The methods for utilizing livestock resources are verified. (Note: The methods for utilizing livestock resources include salvation of buffalo calves, recycling of dry buffaloes, livestock sharing and livestock revolving.)	2-1. Select and prepare the experimental farms	-	Wire fence for quarantine, Installation of basic tent warehouse, Plan of facilities (Calf hatch, Rack for hay, Hook for feed trough and water trough, Disinfection box, Feed mixing box), Plan for management of calf, Recording form, Plan for deployment of staff														Tominaga, Hara	Tominaga, Sugiwaka, Kawamoto, Hara	Electric wiring, plumbing, hygiene equipment, feeding equipment, basic beds	(completed in the 1st year)
		2-1-5. Make preparation for introducing calves to the experimental farm.	List of farms who provide calves, Plan for introducing calves														Tominaga, Hara	Tominaga, Sugiwaka, Hara		
		2-1-6. Introduce calves into the experimental farm. Try various feeding method to compile results of them.	Plan for feeding management, Plan for health and hygiene management, reports														Tominaga, Hara	Tominaga, Sugiwaka, Hara		
	2-2. Examine methods of buffalo calf distribution, dry buffalo recycling and livestock sharing and revolving	2-2-1. Distribute calves on trial basis. Give technical guidance and monitor them to compile results.	Questionnaire for farmers who received calves, Plan for distribution of calves, Plan for monitoring														Tominaga, Hara	All technical experts		
		2-2-2. Examine recycling and sharing methods practiced at cattle colonies and farmers in the region.	Survey plan (survey report)														Tominaga, Hara	All technical experts		
		2-2-3. Examine microcredit, other financial resources and other related organizations.	Survey plan														Ikegaya	All technical experts		
	2-3. Prepare the application plan for utilizing livestock resources	2-3-1. Compile plan for utilizing calves.	Plan for distributing calves														Tominaga, Hara	All technical experts		
		2-3-2. Compile plan for utilizing dry buffalo.	Plan for utilization dry buffalo														Tominaga, Hara	All technical experts		(The activity for utilizing dry baffaloes will be started from the 3rd year)
	2-4. Conduct and analyse the applications	2-4-1. Pilot plan for utilizing calves and evaluate.	Plan for piloting calf utilization plan														Tominaga, Hara	All technical experts		
		2-4-2. Pilot plan for utilizing dry buffalo and evaluate.	Plan for piloting dry buffalo utilization plan														Tominaga, Hara	All technical experts		(The activity for utilizing dry baffaloes will be started from the 3rd year)

:Plan indicated in the Work Plan : Progress

Outputs	Activities		Expected Results	2015												2016	Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY26				FY27												
				2nd Year																
				2	3	4	5	6	7	8	9	10	11	12	1	2				
2. The methods for utilizing livestock resources are verified. (Note: The methods for utilizing livestock resources include salvation of buffalo calves, recycling of dry buffaloes, livestock sharing and livestock revolving.)	2-5. Apply the identified methods to the farmers	2-5-1. Apply calf utilization plan to the farmers.	Draft application plan for calves														Tominaga, Hara	Tominaga, Ikegaya, Kawamoto, Hara		(No progress)
		2-5-2. Apply dry buffalo utilization plan to the farmers.	Draft application plan for dry buffalo														Tominaga, Hara	Tominaga, Ikegaya, Kawamoto, Hara		(The activity for utilizing dry baffaloes will be started from the 3rd year)
	2-6. Monitor and evaluate the application of the identified methods	2-6-1. Compile the result of application of calf utilization method at farmers.	Report on survey of farmers (Utilization of livestock assets).														Tominaga, Hara	Tominaga, Kawamoto, Hara		(No progress)
		2-6-2. Compile the result of application of dry buffalo utilization method at farmers.	Report on survey of farmers (Utilization of livestock assets).														Tominaga, Hara	Tominaga, Kawamoto, Hara		(The activity for utilizing dry baffaloes will be started from the 3rd year)
	2-7. Prepare the guideline of utilizing livestock resources	2-7-1. Compile the guideline for calf utilization methods.	Draft guideline														Tominaga, Hara	All technical experts		(No Progress)
		2-7-2. Compile the guideline for dry buffalo utilization methods.	Draft guideline														Tominaga, Hara	All technical experts		(The activity for utilizing dry baffaloes will be started from the 3rd year)
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts.	3-1. Prepare the extension plan	3-1-1. Explain the extension structure developed at the Master Plan to C/P	Deepened understanding of C/P on extension structure														Okabe	Okabe		(completed in the 1st year)
		3-1-2. Conduct a Participatory Rural Appraisal survey at pilot villages	PRA survey report 2														Okabe	Okabe, Kawamoto		
		3-1-3. Examine the ways to disseminate each appropriate technology from the pilot farms to the surrounding farms based on the situation of the pilot farms and the results of the PRA survey	Extension plan design														Okabe, Tominaga	Okabe, Tominaga, Kawamoto, Hara		
		3-1-4. Examine the ways to disseminate each appropriate technology from farmers to farmers	Extension plan design														Okabe, Kawamoto	Okabe, Tominaga, Kawamoto, Hara		
	3-2. Prepare the extension materials	3-2-1. Conduct interview surveys to extension-related institutions in Sindh province	Existing extension materials collected, possibility of collaboration with potentially available human resources for extension surveyed, deepened understanding of the Project Team on possible obstacles against extension activities														Kawamoto	Kawamoto		(completed in the 1st year)
		3-2-2. Plan the contents of the extension materials for the Project, by referring to the existing ones	Contents of the extension materials design														Tominaga, Kawamoto	Okabe, Tominaga, Kawamoto, Hara		
		3-2-3. Prepare the extension materials based on the monitoring results of the extension activities	Extension materials 1st draft														Tominaga, Kawamoto	Okabe, Tominaga, Kawamoto, Hara		
	3-3. Conduct trainings for the master trainers and extension workers including women	–	Results of the exam, recruitment criteria														Okabe	Okabe, Tominaga, Hara		(completed in the 1st year)
		3-3-5. Monitor the recruitment process of the Livestock Department	Allocation of the project staff as described in the PC-1														Okabe	Okabe		
		3-3-6. Prepare the training plan of the master trainers and extension workers	Training plan including both technical and non-technical aspects														Okabe, Tominaga	Okabe, Tominaga, Kawamoto, Hara		
		3-3-7. Train the master trainers and extension workers	Capacity of master trainers and extension workers enhanced														Okabe, Tominaga	Okabe, Tominaga, Kawamoto, Hara		
		3-3-8. Evaluate the results of the training	Results of the evaluation of the training														Okabe, Tominaga	Okabe, Tominaga, Kawamoto, Hara		
	3-4. Conduct extension activities for farmers	3-4-1. Identify the target farmers for disseminating the technologies and organize them into groups	Farmer groups organized														Kawamoto	Okabe, Tominaga, Kawamoto, Hara		
		3-4-2. Disseminate appropriate technologies to the farmers	Dissemination of the technologies														Tominaga, Kawamoto	Okabe, Tominaga, Kawamoto, Hara		

:Plan indicated in the Work Plan : Progress

Outputs	Activities		Expected Results	2015												2016		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY26						FY27											
				2nd Year																	
				2	3	4	5	6	7	8	9	10	11	12	1	2					
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts.	3-5. Monitor and evaluate the extension activities	3-5-1. Prepare the monitoring plan	Monitoring plan								■							Okabe, Tominaga	All experts		(Monitoring will be started in the 3rd year)
		3-5-2. Monitor the extension activities regularly	Monitoring data									■	■	■	■	■		Okabe, Tominaga	All experts		(Monitoring will be started in the 3rd year)
		3-5-3. Evaluate and compile the monitoring results	Report on extension activities												■			Okabe, Tominaga	All experts		(Monitoring will be started in the 3rd year)
	3-6. Review and revise the extension plan and materials	3-6-1. Review and revise the extension plan and materials	Extension plan (Extension Guideline) 1st draft, extension materials 1st draft												■ ■			Okabe, Tominaga, Kawamoto	All experts		
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-1. Prepare operation guidelines for the Project including project management, information sharing, coordination, etc.	4-1-1. Prepare the draft of operation guidelines for the Project	The first draft of operation guidelines															Okabe	Okabe		(completed in the 1st year)
	4-2. Conduct training for project planning, management and monitoring	4-2-1. Prepare a questionnaire for the Training Needs Assessment for the Livestock Department officers	The questionnaire for the Training Needs Assessment		■													Okabe	Okabe, Ryu, Sarwar		(No training needs assesment conducted)
		4-2-2. Conduct the Training Needs Assessment	The result of the Training Needs Assessment			■	■											Sarwar	Sarwar		(No training needs assesment conducted)
		4-2-3. Send a request for proposal submission	Receipt of proposals				■	■			■							Okabe	Okabe, Ryu		
		4-2-4. Prepare a proposal assessment criteria	The proposal assessment criteria															Okabe	Okabe, Ryu		(completed in the 1st year)
		4-2-5. Prepare drafts of contract, TOR, and a training evaluation sheet	The draft of contract etc.				■	■			■							Okabe	Okabe, Ryu		
		4-2-6. Assess the proposals submitted and select a training institute for sub-contract	The training institute selected for sub-contract															Okabe	Okabe, Ryu		(completed in the 1st year)
		4-2-7. Hold a contract negotiation with the training institute	Conclusion of the contract						■		■							Okabe	Okabe, Ryu		
		4-2-8. Check the detailed training work plan submitted by the sub-contracted training institute	The draft of training work plan						■		■							Okabe	Okabe, Ryu		
		4-2-9. Finalize the participants of the training based on the candidate list submitted by the Livestock Department	The participant list for the training						■			■	■					Okabe	Okabe, Ryu		
		4-2-10. Finalize the drafts of contract, TOR and work plan through discussion with the sub-contracted training institute and conclude the contract	The finalized contract, TOR and the work plan						■			■						Okabe	Okabe, Ryu		
		4-2-11. Discuss with the JICA Non-formal Education Promotion Project to finalize training contents to be entrusted	MOU															Okabe	Okabe, Ryu		(No training carried out by the JICA Non-formal Education Promotion Project)
		4-2-12. Conduct training	Pre test, post test						■	■	■	■	■	■	■			Okabe	Okabe, Ryu		
		4-2-13. Compile the feedback from the participants	The training feedback result											■	■			Ryu	Ryu		
		4-2-14. Discuss with the sub-contracted training institute at a wrap up meeting about the lessons learnt and points to improve for the next year planning	The lessons learnt and points to improve											■		■		Okabe	Okabe, Ryu		

■ :Plan indicated in the Work Plan ■ : Progress

Outputs	Activities		Expected Results	2015											2016		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY26		FY27														
				2nd Year																
				2	3	4	5	6	7	8	9	10	11	12	1	2				
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-3. Establish a livestock development platform for coordination and information sharing among stakeholders	4-3-1. Confirm the venue, participants, and the agenda of the livestock development platform	The livestock development platform program draft (the venue, the invitation list, and the agenda)														Okabe	Okabe		
		4-3-2. Hold a consultation meeting with the livestock department representatives (DG, directors) to explain, discuss and reach a consensus about the livestock development platform contents	Deepened understanding of the Livestock Department representatives on the Project contents														Okabe	Okabe		(Main subjects of the 2nd consulation meeting were the progress of the Project, issues of the Sindh Government and formation of a temporary extension team)
		4-3-3. Hold the livestock development platform	The livestock development platform participant list, the meeting minutes														Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		4-3-4. Reflect the result of the meeting into the next year activity plan	Reflection to the progress report														Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
	4-4. Review and revise the guideline	4-4-1. Hold a consultation meeting with the livestock department representatives (DG, directors) based on the outcome of the training and the platform meeting to explain, discuss and reach a consensus about establishing the task forces in charge of the development and revision of operation guideline	The first draft of the task force														Okabe	Okabe		
		4-4-2. Select the taskforce members with the Livestock Department	Taskforce member list														Okabe	Okabe		
		4-4-3. Hold a meeting with the taskforce members and prepare the action plan	Taskforce action plan														Okabe	Okabe		
		4-4-4. Identify the training needs of the taskforce members and include them in the training plan of 4-2.	Training plan updated														Okabe	Okabe		
		4-4-5. Monitor the actions by the taskforce members	Smooth implementation of the tasks by the members														Okabe	Okabe		(Monitoring and review will be started from the 3rd year)
		4-4-6. Review the results of the actions	Results of the review														Okabe	Okabe		(Monitoring and review will be started from the 3rd year)
		4-4-7. Revise the guideline based on the review of the actions	Guideline 2nd draft														Okabe	Okabe		

:Plan indicated in the Work Plan : Progress

Attachment 2-3 WBS: Detailed Activity Plan and Progress for the Third Year

Detailed Activity Plan and Progress in the Third Year

Outputs	Activities		Expected Results	2016										2017		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY2	FY28														
				3rd Year															
				3	4	5	6	7	8	9	10	11	12	1	2				
0. Project plan is developed, and implementation structure is organized.	0-1. Develop a work plan draft (in Japan)	0-1-1. Develop a work plan (in Japanese) (Including PDM ver.2 draft)	The draft of work plan(in Japanese)													Okabe	Okabe, Ikegaya, Tominaga		
		0-1-2. Discuss with JICA and finalize the work plan (in Japanese)	The work plan final(in Japanese)													Okabe	Okabe		
		0-1-3. Develop a work plan (in English) (Including PDM ver.2 draft)	The first draft of work plan (in English)													Okabe	Okabe, Ikegaya, Tominaga, Yugeta		
	0-2. Kick off project activities	0-2-1. Open the project office	Start of work at the project office																(completed in the 1st year)
		0-2-2. Conduct a kick-off meeting to explain the draft of work plan, discuss, and reach a consensus	The second draft of work plan													Okabe	Okabe, Ikegaya, Tominaga		
	0-3.Conduct the baseline survey	–	Baseline survey report, Appropriate Technology Development Checklist																(completed in the 1st year)
	0-4. Finalize the work plan	0-4-1. Decide the venue, participants and agenda of the Steering Committee meeting	The Steering committee meeting program draft (Venue, participant list and agenda)													Okabe	Okabe		
		0-4-2. Hold a consultation meeting with Livestock Department representatives (DG and directors) to explain the agenda of the S/C meeting, discuss and reach a consensus	Deepened understanding of the Livestock Department representatives on the Project													Okabe	Okabe		
		0-4-3. Prepare presentation materials	Presentation materials													Okabe, Tominaga	Okabe, Tominaga		
		0-4-4. Hold the S/C meeting	The meeting minutes,													Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Yugeta, Hara		
		0-4-5. Revise PDM ver.2 draft based on the results of the S/C meeting	PDM ver.2 (revised)													Okabe	Okabe, Tominaga		
		0-4-6. Finalize PDM ver.2 draft through discussion with C/P and JICA	Finalized PDM ver.2													Okabe	Okabe		
		0-4-7. Finalize the work plan	Finalized work plan													Okabe	Okabe		
	0-5. Develop the project PR materials	–	Project leaflet (Japanese, English, Sindh)																(completed in the 1st year)
		0-5-4. By assisting the construction of the website for the Livestock Department, upload the project information	Website													Okabe	Okabe, Yugeta		(Support appropriately in accordance with request from the Livestock Department)

:Plan indicated in the Work Plan : Progress

Detailed Activity Plan and Progress in the Third Year

Outputs	Activities		Expected Results	2016 FY28 3rd Year 3	4	5	6	7	8	9	10	11	12	2017 1	2	Responsible Person	Implementers	Major equipment and facilities	Remarks
0. Project plan is developed, and implementation structure is organized.	0-6. Conduct the third country training in India	–	The final study tour plan in India																(completed in the 2nd year)
		0-6-5. Prepare for the third country training in India	The final study tour plan in India													Ikegaya	Ikegaya, Tominaga, Hara		(The project team carried out preparation. The plan, however, was cancelled based on JICA's decision.)
		0-6-6. Conduct the third country training in India	The third country training completion report													Ikegaya	Ikegaya, Tominaga, Hara		(Ditto)
		0-6-7. Prepare for the third country training in Thailand	The study tour plan in Thailand													Tominaga,Hara	Tominaga, Hara		(The plan was changed from Third country training in India to in Thailand. The preparatory trip to Thailand was organized.)
	0-7. Conduct the training in Japan	0-7-1. Develop training in Japan plan	Training in Japan plan													Tominaga	Tominaga, Yugeta		(The training in Japan will be conducted in the 4th year)
		0-7-2. Conduct training in Japan	Training in Japan completion report													Yugeta	Tominaga, Yugeta		(The training in Japan will be conducted in the 4th year)
	0-8. Develop the 4th year work plan draft	0-8-1. Together with C/P, evaluate the activities in the 3rd year	The result of the evaluation workshop for the 3rd year													Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-8-2. Discuss with C/P about the work plan draft for the 4th year	The first draft of the 4th year work plan													Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-8-3. Based on the discussion, modify the PDM ver.1 and develop the PDM ver.2 (draft)	The PDM ver.2 (draft)													Okabe	Okabe, Tominaga		(Based on the result of the mid-term review, the PDM ver.3 was developed and finalized)
	0-9. Develop the progress report	0-9-1. Based on the results of above activities, develop the draft of the progress report (Japanese and English)	The draft of the progress report													Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-9-2. Discuss with JICA and finalize the progress report	The progress report final													Okabe	Okabe, Ikegaya, Tominaga		
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-1. Select the Pilot Farms	-	List of pilot farms													Tominaga	Tominaga, Ikegaya, Yugeta		(completed in the 2nd year)
	1-2. Prepare the technology development plan with pilot farmers	1-2-1. Visit pilot farms by a group of 2 members of C/P to grasp situation of pilot farms.	Format for recording pilot farm data, data of pilot farms													Tominaga	Tominaga		
		1-2-2. Draft development plan.	Draft activity plan of each specialized field													Tominaga	Tominaga, Hara		
		1-2-3. Visit pilot farms to exchange opinion and draft appropriate technology development plan.	Table of weekly interview and monthly measurement day, Plan of appropriate technology for the 1st year													Tominaga	Tominaga, Hara		
	1-3 Conduct and analyze the on-farm application at pilot farms	1-3-1. Conduct weekly interview and monthly measurement at pilot farms.	Weekly interview format, Monthly measurement recording format, Basic Data													Tominaga	Tominaga, Ikegaya, Sugiwaka, Kobayashi, Hara		
		1-3-2. Organize a study tour for pilot farms.	List of appropriate technology, plan for establishment of appropriate technology													Tominaga	Tominaga, Hara		No activities was done in the 3rd year
		1-3-3. Grasp current farm management of pilot farms and give technical guidance to them.	Weekly farm management data, Monthly animal inventory data, Draft model of farm management													Tominaga	Tominaga, Hara		

:Plan indicated in the Work Plan : Progress

Detailed Activity Plan and Progress in the Third Year

Outputs	Activities		Expected Results	2016 FY28 3rd Year: 3 4 5 6 7 8 9 10 11 12 / 2017: 1 2	Responsible Person	Implementers	Major equipment and facilities	Remarks
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-3 Conduct and analyze the on-farm application at pilot farms	1-3-4. Monitor distribution channel and price of animal products in and surrounding pilot farms to propose alternative marketing models. Conduct pilot activities including market survey by farmers, household budget making, collaboration with private companies.	Monthly data of price of animal products, Model for increasing price of animal products, Model for selling animal products, Draft technical guideline for marketing, Draft extension materials		Tominaga	Tominaga, Ikegaya, Hara		
		1-3-5. Devise the system for collecting, accumulating and disseminating market information in the livestock department	Market information collected, System for disseminating market information		Tominaga	Tominaga, Ikegaya, Hara		
		1-3-6. Install animal management facilities to prove animal management techniques and monitor outcomes.	Drawing for iron pipe race, Model race facilities (for the pilot farmers selected in the 2nd year)		Tominaga	Tominaga, Kawamoto, Hara	Iron pipe, welding rods and hinges for steel pipe race, Wood pieces, wood plate, nails, concrete blocks for wooden animal management frame facilities	Finalization of installation place, Drafting drawings, Procurement of materials (The plan was changed and MS pipe race were installed instead of iron pipe race)
			Drawing for MS pipe race, Model race facilities (for the pilot farmers selected in the 2nd year)		Tominaga	Tominaga, Hara	MS pipe, and fixing clamp	Finalization of installation place, Drafting drawings, Procurement of materials (The plan was changed and MS pipe race were installed instead of iron pipe race)
		1-3-7. Give technical guidance to increase milk production at pilot farms.	Improvement of basic milking shed and paddock, improvement of mixed concentrate feed		Tominaga	Tominaga, Sugiwaka, Kawamura, Kobayashi, Hara	Logs, Bamboos, Nails, Wooden door, Bricks	Finalization of installation place, Drafting drawings, Procurement of materials
		1-3-8. Develop efficient animal management systems and facilities to reduce physical environment stress of animals.	Model facilities for shade, wind protection, ventilation, water trough, feed trough, hoof cutting etc.		Tominaga	Tominaga, Sugiwaka, Kawamura, Kobayashi, Hara	Wood materials, Paints, Plastic sheet, Oil drum, Hoof cutter	
		1-3-9. Develop appropriate feed model by calculating nutritious requirement of each type of animals and stage of growing. Utilize locally available feed.	Table of ingredients, model for feed		Tominaga	Tominaga, Sugiwaka, Kawamura, Kobayashi, Hara	PH meter, Spectrophoto meter, Nitrogen Analyzer, Cutting mill	Request for analysis of fodder to PCSIR and laboratory of Livestock Department in Karachi, Evaluation of analysis results
			Result of analysis		Tominaga	Tominaga, Kobayashi, Hara		(Fodder analysis was carried out in PRI Karachi)
		1-3-10. Survey nutritious value and micro mineral in the soil to study it's impact on feeds. Give technical guidance to pilot farmers about appropriate feed.	Soil analysis table, Draft technical guidance plan for feed		Tominaga	Tominaga, Kawamura, Kobayashi, Hara		
		1-3-11. Study shortage of roughage supply during preharvest periods to give appropriate technical guidance on feed storage. Give technical guidance how to increase production of roughage.	Draft plan for hay preparation formula, Draft plan for fermenting rice straw with ammonia, Draft plan for growing feed plants		Tominaga	Tominaga, Kawamura, Hara		(Fermenting rice straw with ammonia was excluded)
		1-3-12. Conduct training on reproductive disorder diagnosis and treatment to improve conception rate of female animals.	Accumulation of reproduction treatment and technologies		Tominaga	Tominaga, Abe, Hara	Animal Reproductive Organ	
		1-3-13. Conduct training on andrology reproductive function diagnosis to improve reproductive rate of male animals.	Accumulation and evaluation of treatment data, the first training by the third country expert		Tominaga	Tominaga, Hara		(Postponed to 4th year)

:Plan indicated in the Work Plan : Progress

Detailed Activity Plan and Progress in the Third Year

Outputs	Activities		Expected Results	2016 (3 4 5 6 7 8 9 10 11 12) / 2017 (1 2) — FY2 FY28 3rd Year	Responsible Person	Implementers	Major equipment and facilities	Remarks
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-3 Conduct and analyze the on-farm application at pilot farms	1-3-14. Conduct joint research on reproductive physiology of Khundi buffalo and Zebu with Sindh Agriculture University Tandojam (and other) to develop guideline for increasing conception rate. Carry out small scale pilot AI.	List of persons in charge, Draft plan for reproductive physiology survey		Tominaga	Tominaga,Tsumagari, Hara	IGF1 kit	(Collaborative organization was changed from Sindh Agriculture Univ. to CVDL. The project carried out physiology survey of buffalo reared in CVDL.)
		1-3-15. Sensitize and give technical guidance on preventive animal health. Grasp the current situation on brucellosis and tuberculosis to examine appropriate measure to be taken.	Draft plan for vaccination and deworming, Disease diagnosis card, Draft plan of mastitis measure, Draft plan for brucellosis and tuberculosis		Tominaga	Tominaga, Abe, Hara		
		1-3-16. Introduce elite breeding bull into pilot villages on trial basis and establish model for genetic improvement.	Accumulation and analysis of milk production data		Tominaga	Tominaga, Nagamine, Chiba, Hara		
			Selection of elite breeding bull		Tominaga	Tominaga, Nagamine, Chiba, Hara		(The activity has been delayed)
		1-3-17. Establish pedigree registration model for Khundi buffalo.	Draft plan for pedigree registration, Accumulation of data for pedigree registration software, issuance of pedigree registration certificate		Tominaga	Tominaga, Chiba, Hara		
	1-4 Apply the identified technologies to the surrounding farms	Refer to Activity 3-4						
	1-5 Monitor and evaluate the application of the identified technologies at farms	Refer to Activity 3-4						
	1-6. Conduct researches and/or activities with the stakeholders	1-6-1.Conduct activities related to feed, genetic improvement and reproduction in collaboration with Sindh Agriculture University Tandojam.	Data accumulation, analysis and evaluation, activity report		Tominaga, Hara	Tominaga, Kobayashi, Abe, Nagamine, Chiba, Hara		(Only activities related to feed was carried out in the 3rd year)
			Data accumulation about micro mineral		Tominaga, Hara	Tominaga Kobayashi, Hara		(Only activities related to feed was carried out in the 3rd year)
		1-6-2.Carry out activities in collaboration with Engro Fertilizer Ltd.	Activity report		Tominaga, Hara	Tominaga, Kobayashi, Hara		
		1-6-3. Carry out activities with other related organization.	Activity report		Tominaga, Hara	Tominaga, Hara		
	1-7. Prepare the guideline of technology	1-7-1. Compile case study of established technology. Collect related information and data.	List of information collected, Data collected		Tominaga, Kawamoto, Hara	All technical experts		
		1-7-2. Develop manual for technicians.	Manual for technicians of each field		Tominaga, Kawamoto, Hara	All technical experts		
		1-7-3. Develop manual for farmers.	Manual for farmers of each field		Tominaga, Kawamoto, Hara	All technical experts		

:Plan indicated in the Work Plan : Progress

Detailed Activity Plan and Progress in the Third Year

Outputs	Activities		Expected Results	2016 3	4	5	6	7	8	9	10	11	12	2017 1	2	Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY2	FY28 3rd Year														
2. The methods for utilizing livestock resources are verified. (Note: The methods for utilizing livestock resources include salvation of buffalo calves, recycling of dry buffaloes, livestock sharing and livestock revolving.)	-	-														Tominaga, Hara	Tominaga, Sugiwaka, Kawamoto, Hara	Electric wiring, plumbing, hygiene equipment, feeding equipment, basic beds	(completed in the 1st year)
	2-1. Select and prepare the experimental farms	2-1-5. Make preparation for introducing calves to the experimental farm.	List of farms who provide calves, Plan for introducing calves													Tominaga, Hara	Tominaga, Sugiwaka, Hara		(completed in the 2nd year)
		2-1-6. Introduce calves into the experimental farm. Try various feeding method to compile results of them.	Plan for feeding management, Plan for health and hygiene management, reports													Tominaga, Hara	Tominaga, Sugiwaka, Kawamura, Hara		
	2-2. Examine methods of buffalo calf distribution, dry buffalo recycling and livestock sharing and revolving	2-2-1. Distribute calves on trial basis. Give technical guidance and monitor them to compile results.	Questionnaire for farmers who received calves, Plan for distribution of calves, Plan for monitoring													Tominaga, Hara	All technical experts		
		2-2-2. Examine recycling and sharing methods practiced at cattle colonies and farmers in the region.	Survey report													Tominaga, Hara	All technical experts		(completed in the 2nd year)
		2-2-3. Examine microcredit, other financial resources and other related organizations.	Survey report													Hara	All technical experts		
	2-3. Prepare the application plan for utilizing livestock resources	2-3-1. Compile plan for utilizing calves.	Plan for distributing calves													Tominaga, Hara	All technical experts		
		2-3-2. Compile plan for utilizing dry buffalo.	Plan for utilization dry buffalo													Tominaga, Hara	All technical experts		
	2-4. Conduct and analyze the applications	2-4-1. Pilot plan for utilizing calves and evaluate.	Plan for piloting calf utilization plan													Tominaga, Hara	All technical experts		
		2-4-2. Pilot plan for utilizing dry buffalo and evaluate.	Plan for piloting dry buffalo utilization plan													Tominaga, Hara	All technical experts		
	2-5. Apply the identified methods to the farmers	2-5-1. Apply calf utilization plan to the farmers.	Draft application plan for calves													Tominaga, Hara	Tominaga, Ikegaya, Kawamoto, Hara		
		2-5-2. Apply dry buffalo utilization plan to the farmers.	Draft application plan for dry buffalo													Tominaga, Hara	Tominaga, Ikegaya, Kawamoto, Hara		(Activity will be carried out in the 4th year)
	2-6. Monitor and evaluate the application of the identified methods	2-6-1. Compile the result of application of calf utilization method at farmers.	Report on survey of farmers (Utilization of livestock assets).													Tominaga, Hara	Tominaga, Kawamoto, Hara		
		2-6-2. Compile the result of application of dry buffalo utilization method at farmers.	Report on survey of farmers (Utilization of livestock assets).													Tominaga, Hara	Tominaga, Kawamoto, Hara		(Activity will be carried out in the 4th year)
	2-7. Prepare the guideline of utilizing livestock resources	2-7-1. Compile the guideline for calf utilization methods.	Draft guideline													Tominaga, Hara	All technical experts		
		2-7-2. Compile the guideline for dry buffalo utilization methods.	Draft guideline													Tominaga, Hara	All technical experts		(Activity will be carried out in the 4th year)

:Plan indicated in the Work Plan : Progress

Detailed Activity Plan and Progress in the Third Year

Outputs	Activities		Expected Results	2016 FY28 3rd Year: 3 4 5 6 7 8 9 10 11 12	2017: 1 2	Responsible Person	Implementers	Major equipment and facilities	Remarks
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts.	3-1. Prepare the extension plan	-	Extension plan (Extension Guideline) ver.1			-	-		(completed in the 2nd year)
	3-2. Prepare the extension materials	-	Extension Material ver.1			-	-		(completed in the 2nd year)
		3-2-3. Prepare the extension materials based on the monitoring results of the extension activities	Extension Material ver.2	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■	Tominaga, Kawamoto	Okabe, Tominaga, Kawamoto, Hara		
	3-3. Conduct trainings for the master trainers and extension workers including women	–	Results of the exam, recruitment criteria			Okabe	Okabe, Tominaga, Hara		(completed in the 1st year)
		3-3-5. Monitor the recruitment process of the Livestock Department	Allocation of the project staff as described in the PC-1	■ ■		Okabe	Okabe		17 of Newly recruited staff (1 SM, 1 GS, 5 MTs and 10 EWs)
		3-3-6. Prepare the training plan of the master trainers and extension workers	Training plan including both technical and non-technical aspects	■ ■ ■ ■		Okabe, Tominaga	Okabe, Tominaga, Kawamoto, Hara		
		3-3-7. Train the master trainers and extension workers	Capacity of master trainers and extension workers enhanced	■ ■ ■ ■ ■ ■ ■ ■ ■ ■		Okabe, Tominaga	Okabe, Tominaga, Kawamoto, Hara		
		3-3-8. Evaluate the results of the training	Results of the evaluation of the training	■ ■ ■ ■ ■ ■		Okabe, Tominaga	Okabe, Tominaga, Kawamoto, Hara		
	3-4. Conduct extension activities for farmers	3-4-1. Identify the target farmers for disseminating the technologies and organize them into groups	Farmer groups organized (pilot farmers)	■ ■ ■ ■ ■		Kawamoto	Okabe, Tominaga, Kawamoto, Hara		
			Farmer groups organized (neighboring farmers)	■ ■ ■ ■ ■		Kawamoto	Okabe, Tominaga, Kawamoto, Hara		(No Progress)
		3-4-2. Disseminate appropriate technologies to the farmers	Dissemination of the technologies (pilot farmers)	■ ■ ■ ■ ■ ■ ■ ■ ■ ■		Tominaga, Kawamoto	Okabe, Tominaga, Kawamoto, Hara		
			Dissemination of the technologies (neighboring farmers)	■ ■ ■ ■ ■ ■ ■ ■ ■ ■		Tominaga, Kawamoto	Okabe, Tominaga, Kawamoto, Hara		(No Progress)
	3-5. Monitor and evaluate the extension activities	3-5-1. Prepare the monitoring plan	Monitoring plan	■ ■ ■ ■ ■ ■ ■ ■ ■ ■		Okabe, Tominaga	All experts		Revision of Appropriate Technology Development Checklist
		3-5-2. Monitor the extension activities regularly	Monitoring data	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■	Okabe, Tominaga	All experts		(No Progress)
		3-5-3. Evaluate and compile the monitoring results	Report on extension activities	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■	Okabe, Tominaga	All experts		(No Progress)
	3-6. Review and revise the extension plan and materials	3-6-1. Review and revise the extension plan and materials	Extension plan (Extension Guideline) 2nd draft, extension materials 2nd draft	■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■	Okabe, Tominaga, Kawamoto	All experts		

■:Plan indicated in the Work Plan ■ : Progress

Detailed Activity Plan and Progress in the Third Year

Outputs	Activities		Expected Results	2016 FY28 3rd Year 3	4	5	6	7	8	9	10	11	12	2017 1	2	Responsible Person	Implementers	Major equipment and facilities	Remarks
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-1. Prepare operation guidelines for the Project including project management, information sharing, coordination, etc.	–	The first draft of operation guidelines													Okabe	Okabe, Sarwar		(completed in the 1st year)
	4-2. Conduct training for project planning, management and monitoring	–	The questionnaire for the Training Needs Assessment, the result for the Training Needs Assessment													Okabe	Okabe, Sarwar		(completed in the 1st year)
		–	Receipt of proposals from the training institute, the proposal assessment criteria, The training institute selected for sub-contract													Okabe	Okabe		(completed in the 1st year)
		–	MOU with the JICA Non-formal Education Promotion Project on implementation of the training													Okabe	Okabe		(completed in the 1st year)
		4-2-1. Hold regular meetings with taskforce members, make a plan for training, and monitor the progress of "Actions" of training participants	The training plan, meeting minutes													Okabe	Okabe, Yugeta, Sarwar		
		4-2-2. Hold two or three consultation meetings, develop a consensus on a training plan, and report and discuss the progress of "Actions" of training participants	The meeting minutes													Okabe	Okabe, Yugeta, Sarwar		
		4-2-3. Prepare drafts of contract and TOR for implementation of the training	The draft of contract etc.													Okabe	Okabe, Yugeta		
		4-2-4. Check and finalize the training work plan submitted by the sub-contracted training institute	The draft of training work plan													Okabe	Okabe, Yugeta		
		4-2-5. Hold a contract negotiation with the training institute, and conclude the contract	The finalized contract, TOR and the work plan													Okabe	Okabe, Yugeta		
		4-2-6. Finalize the participants of the training based on the candidate list submitted by the Livestock Department	The participant list for the training													Sarwar	Sarwar		
		4-2-7. Conduct training	Pre-test, post-test													Okabe	Okabe, Yugeta, Sarwar		
		4-2-8. "Actions" taken by training participants	"Actions" decided through training													Training participants	Training participants		
		4-2-9. Select candidates for master trainer from training participant	The candidate list for master trainer													Okabe	Okabe, Sarwar		
		4-2-10. Conduct training for master trainers	Pre test, post test													Okabe	Okabe, Yugeta, Sarwar		
		4-2-13. Compile the feedback from the participants and the results of pre-tests and post-tests	The training feedback result													Okabe	Yugeta		
		4-2-12. Review the result of training and "Actions" with training participants and taskforce	Revision of the plan for "Actions", the next year's training plan													Okabe	Okabe, Yugeta, Sarwar		
		4-2-13. Discuss with the sub-contracted training institute at a wrap up meeting	The lessons learnt and points to improve													Okabe	Okabe, Yugeta, Sarwar		

:Plan indicated in the Work Plan : Progress

Detailed Activity Plan and Progress in the Third Year

Outputs	Activities		Expected Results	2016									2017		Responsible Person	Implementers	Major equipment and facilities	Remarks
				FY2	FY28													
				3rd Year														
				3	4	5	6	7	8	9	10	11	12	1	2				
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-3. Establish a livestock development platform for coordination and information sharing among stakeholders	4-3-1. Confirm the venue, participants, and the agenda of the livestock development platform	The livestock development platform program draft (the venue, the invitation list, and the agenda)													Okabe	Okabe, Sarwar		
		4-3-2. Hold a consultation meeting with the livestock department representatives (DG, directors) to explain, discuss and reach a consensus about the livestock development platform contents	Deepened understanding of the Livestock Department representatives on the Project contents													Okabe	Okabe, Sarwar		
		4-3-3. Hold the livestock development platform	The livestock development platform participant list, the meeting minutes													Okabe	Okabe, Tominaga, Kawamoto, Hara, Yugeta		
		4-3-4. Reflect the result of the meeting into the next year activity plan	Reflection to the progress report													Okabe	Okabe, Tominaga, Kawamoto, Hara, Yugeta		
	4-4. Review and revise the guideline	-	Taskforce member list													Okabe	Okabe		(completed in the 2nd year)
		Refer to Activity 4-2																	
		4-4-7. Revise the guideline based on the review of the actions	Guideline 2nd draft													Okabe	Okabe, Sarwar		

:Plan indicated in the Work Plan : Progress

Attachment 2-4 WBS: Detailed Activity Plan and Progress for the Fourth Year

Detailed Activity Plan and Progress for the Fourth Year

Outputs	Activities		Expected Results	2017 28	FY29 4th year 3	4	5	6	7	8	9	10	11	12	2018 1	2	Responsible Person	Implementers	Major equipment and facilities	Remarks
0. Project plan is developed, and implementation structure is organized.	0-1. Develop a work plan draft (in Japan)	0-1-1. Develop a work plan (in Japanese)	The draft of work plan (in Japanese)														Okabe	Okabe, Ikegaya, Tominaga		
		0-1-2. Discuss with JICA and finalize the work plan (in Japanese)	The work plan final (in Japanese)														Okabe	Okabe		
		0-1-3. Develop a work plan (in English)	The first draft of work plan (in English)														Okabe	Okabe, Ikegaya, Tominaga, Yugeta		
	0-2. Kick off project activities	0-2-1. Open the project office	Start of work at the project office																	(completed in the 1st year)
		0-2-2. Conduct a kick-off meeting to explain the draft of work plan, discuss, and reach a consensus	The second draft of work plan														Okabe	Okabe, Ikegaya, Tominaga		
	0-3.Conduct the baseline survey	—	Baseline survey report, Appropriate Technology Development Checklist																	(completed in the 1st year)
	0-4. Finalize the work plan	0-4-1. Decide the venue, participants and agenda of the Steering Committee meeting	The Steering committee meeting program draft (Venue, participant list and agenda)														Okabe	Okabe		
		0-4-2. Hold a consultation meeting with Livestock Department representatives (DG and directors) to explain the agenda of the S/C meeting, discuss and reach a consensus	Deepened understanding of the Livestock Department representatives on the Project														Okabe	Okabe		
		0-4-3. Prepare presentation materials	Presentation materials														Okabe, Tominaga	Okabe, Tominaga		
		0-4-4. Hold the S/C meeting	The meeting minutes,														Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Yugeta, Hara		
		0-4-5. Revise PDM based on the results of the S/C meeting	Revised PDM (draft)														Okabe	Okabe, Tominaga		(If necessary)
		0-4-6. Finalize the revised PDM (draft) through discussion with C/P and JICA	Revised PDM														Okabe	Okabe		(If necessary)
		0-4-7. Finalize the work plan	Finalized work plan														Okabe	Okabe		
	0-5. Develop the project PR materials	—	Project leaflet (Japanese, English, Sindh)																	(completed in the 1st year)
		0-5-4. By assisting the construction of the website for the Livestock Department, upload the project information	Website														Okabe	Okabe, Yugeta		(Support appropriately in accordance with request from the Livestock Department)
	0-6. Conduct the third country training in Thailand	—	The final study tour plan in India																	(completed in the 2nd year)
		0-6-5. Prepare for the third country training in India	The final study tour plan in India														Ikegaya	Ikegaya, Tominaga, Hara		(Plan has revised in the 3rd year)
		0-6-6. Conduct the third country training in India	The third country training completion report														Ikegaya	Ikegaya, Tominaga, Hara		(Plan has revised in the 3rd year)
		0-6-7. Prepare for the third country training in Thailand	The final study tour plan in Thailand														Tominaga, Hara	Tominaga, Hara		
		0-6-8. Conduct the third country training in Thailand	The third country training completion report														Tominaga, Hara	Tominaga, Hara, Ikegaya		

:Plan indicated in the Work Plan : Progress

Outputs	Activities		Expected Results	2017 (28 / FY29 4th year: 3 4 5 6 7 8 9 10 11 12) 2018 (1 2)	Responsible Person	Implementers	Major equipment and facilities	Remarks
0. Project plan is developed, and implementation structure is organized.	0-7. Conduct the training in Japan	0-7-1. Develop training in Japan plan	Training in Japan plan		Tominaga	Tominaga, Yugeta		
		0-7-2. Conduct training in Japan	Training in Japan completion report		Yugeta	Tominaga, Yugeta		
	0-8. Develop the 5th year work plan draft	0-8-1. Together with C/P, evaluate the activities in the 3rd year	The result of the evaluation workshop for the 4th year		Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-8-2. Discuss with C/P about the work plan draft for the 4th year	The first draft of the 5th year work plan		Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-8-3. Based on the discussion, modify the PDM and develop the revised PDM	The revised PDM		Okabe	Okabe, Tominaga		(If necessary)
	0-9. Develop the progress report	0-9-1. Based on the results of above activities, develop the draft of the progress report (Japanese and English)	The draft of the progress report		Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara		
		0-9-2. Discuss with JICA and finalize the progress report	The progress report final		Okabe	Okabe, Ikegaya, Tominaga		
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-1. Select the Pilot Farms	-	List of pilot farms					(completed in the 2nd year)
	1-2. Prepare the technology development plan with pilot farmers	-	Format for recording pilot farm data, data of pilot farms					(completed in the 3rd year)
	1-3 Conduct and analyze the on-farm application at pilot farms	1-3-1. Conduct weekly interview and monthly measurement at pilot farms.	Weekly interview format, Monthly measurement recording format, Basic Data		Tominaga	Tominaga, Ikegaya, Kawamura, Kobayashi, Hara		
		1-3-2. Organize a study tour for pilot farms.	List of appropriate technology, plan for establishment of appropriate technology		Tominaga	Tominaga, Hara		
		1-3-3. Grasp current farm management of pilot farms and give technical guidance to them.	Weekly farm management data, Monthly animal inventory data, Draft model of farm management		Tominaga	Tominaga, Hara		
		1-3-4. Monitor distribution channel and price of animal products in and surrounding pilot farms to propose alternative marketing models. Conduct pilot activities including market survey by farmers, household budget making, collaboration with private companies.	Monthly data of price of animal products, Model for increasing price of animal products, Model for selling animal products, Draft technical guideline for marketing, Draft extension materials		Tominaga	Tominaga, Ikegaya, Hara		
		1-3-5. Devise the system for collecting, accumulating and disseminating market information in the livestock department	Market information collected, System for disseminating market information		Tominaga	Tominaga, Ikegaya, Hara		
		1-3-6. Install animal management facilities to prove animal management techniques and monitor outcomes.	Drawing for iron pipe race, Model race facilities (for the pilot farmers selected in the 2nd year)		Tominaga	Tominaga, Kawamoto, Hara	Iron pipe, welding rods and hinges for steel pipe race, Wood pieces, wood plate, nails, concrete blocks for wooden animal management frame facilities	Finalization of installation place, Drafting drawings, Procurement of materials
			Drawing for MS pipe race, Model race facilities (for the pilot farmers selected in the 2nd year)		Tominaga	Tominaga, Hara	MS pipe, and fixing clamp	Finalization of installation place, Drafting drawings, Procurement of materials (The plan was changed and MS pipe race were installed instead of iron pipe race)
		1-3-7. Give technical guidance to increase milk production at pilot farms.	Improvement of basic milking shed and paddock, improvement of mixed concentrate feed		Tominaga	Tominaga, Kawamura, Kobayashi, Hara	Logs, Bamboos, Nails, Wooden door, Bricks	Finalization of installation place, Drafting drawings, Procurement of materials

:Plan indicated in the Work Plan : Progress

Outputs	Activities		Expected Results	2017 28 FY29 4th year 3 4 5 6 7 8 9 10 11 12	2018 1 2	Responsible Person	Implementers	Major equipment and facilities	Remarks
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-3 Conduct and analyze the on-farm application at pilot farms	1-3-8. Develop efficient animal management systems and facilities to reduce physical environment stress of animals.	Model facilities for shade, wind protection, ventilation, water trough, feed trough, hoof cutting etc.			Tominaga	Tominaga, Kawamura, Kobayashi, Hara	Wood materials, Paints, Plastic sheet, Oil drum, Hoof cutter	
		1-3-9. Develop appropriate feed model by calculating nutritious requirement of each type of animals and stage of growing. Utilize locally available feed.	Table of ingredients, model for feed			Tominaga	Tominaga, Kawamura, Kobayashi, Hara	PH meter, Spectrophoto meter, Nitrogen Analyzer, Cutting mill	Request for analysis of fodder to PCSIR and laboratory of Livestock Department in Karachi, Evaluation of analysis results
			Result of analysis			Tominaga	Tominaga, Kobayashi, Hara		Fodder analysis was carried out in PRI Karachi
		1-3-10. Survey nutritious value and micro mineral in the soil to study it's impact on feeds. Give technical guidance to pilot farmers about appropriate feed.	Soil analysis table, Draft technical guidance plan for feed			Tominaga	Tominaga, Kawamura, Kobayashi, Hara		
		1-3-11. Study shortage of roughage supply during preharvest periods to give appropriate technical guidance on feed storage. Give technical guidance how to increase production of roughage.	Draft plan for hay preparation formula, Draft plan for fermenting rice straw with ammonia, Draft plan for growing feed plants			Tominaga	Tominaga, Kobayashi, Hara		
		1-3-12. Conduct training on reproductive disorder diagnosis and treatment to improve conception rate of female animals.	Accumulation of reproduction treatment and technologies			Tominaga	Tominaga, Ono, Hara	Animal Reproductive Organ	Visit to candidate place for training on animal reproduction
		1-3-13. Conduct training on andrology reproductive function diagnosis to improve reproductive rate of male animals.	Accumulation and evaluation of treatment data, the first training by the third country expert			Tominaga	Tominaga, Hara		
		1-3-14. Conduct joint research on reproductive physiology of Khundi buffalo and Zebu with Sindh Agriculture University Tandojam (and other) to develop guideline for increasing conception rate. Carry out small scale pilot AI.	Result of reproductive physiology survey at CVDL			Tominaga	Tominaga, Tsumagari, Hara	IGF1 kit	
		1-3-15. Sensitize and give technical guidance on preventive animal health. Grasp the current situation on brucellosis and tuberculosis to examine appropriate measure to be taken.	Draft plan for vaccination and deworming, Disease diagnosis card, Draft plan of mastitis measure, Draft plan for brucellosis and tuberculosis			Tominaga	Tominaga, Abe, Hara		
		1-3-16. Introduce elite breeding bull into pilot villages on trial basis and establish model for genetic improvement.	Accumulation and analysis of milk production data			Tominaga	Tominaga, Nagamine, Chiba, Hara		
			Selection of elite breeding bull			Tominaga	Tominaga, Nagamine, Chiba, Hara		
		1-3-17. Establish pedigree registration model for Khundi buffalo.	Accumulation of data for pedigree registration software, issuance of pedigree registration certificate			Tominaga	Tominaga, Chiba, Hara		
	1-4 Apply the identified technologies to the surrounding farms	Refer to Activity 3-4							
	1-5 Monitor and evaluate the application of the identified technologies at farms	Refer to Activity 3-4							

:Plan indicated in the Work Plan : Progress

Outputs	Activities		Expected Results	2017 (28 / FY29 / 4th year: 3 4 5 6 7 8 9 10 11 12) 2018 (1 2)	Responsible Person	Implementers	Major equipment and facilities	Remarks
1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms with gender consideration.	1-6. Conduct researches and/or activities with the stakeholders	1-6-1.Conduct activities related to feed, genetic improvement and reproduction in collaboration with Sindh Agriculture University Tandojam.	Data accumulation, analysis and evaluation, activity report		Tominaga, Hara	Tominaga, Kobayashi, Abe, Nagamine, Chiba,		
			Data accumulation about micro mineral		Tominaga, Hara	Tominaga Koyabashi, Hara		
		1-6-2.Carry out activities in collaboration with Engro Fertilizer Ltd.	Activity report		Tominaga, Hara	Tominaga, Kobayashi, Hara		
		1-6-3. Carry out activities with other related organization.	Activity report		Tominaga, Hara	Tominaga, Hara		
	1-7. Prepare the guideline of technology	1-7-1. Compile case study of established technology. Collect related information and data.	List of information collected, Data collected		Tominaga, Kawamoto, Hara	All technical experts		
		1-7-2. Develop manual for technicians.	Manual for technicians of each field		Tominaga, Kawamoto, Hara	All technical experts		
		1-7-3. Develop manual for farmers.	Manual for farmers of each field		Tominaga, Kawamoto, Hara	All technical experts		
2. The methods for utilizing livestock resources are verified. (Note: The methods for utilizing livestock resources include salvation of buffalo calves, recycling of dry buffaloes, livestock sharing and livestock revolving.)	2-1. Select and prepare the experimental farms	-			Tominaga, Hara	Tominaga, Sugiwaka, Kawamoto, Hara	Electric wiring, plumbing, hygiene equipment, feeding equipment, basic beds	(completed in the 1st year)
		2-1-5. Make preparation for introducing calves to the experimental farm.	List of farms who provide calves, Plan for introducing calves		Tominaga, Hara	Tominaga, Sugiwaka, Hara		(completed in the 2nd year)
		2-1-6. Introduce calves into the experimental farm. Try various feeding method to compile results of them.	Activity report		Tominaga, Hara	Tominaga, Kawamura, Hara		(Implemented by PC-1 budget)
	2-2. Examine methods of buffalo calf distribution, dry buffalo recycling and livestock sharing and revolving	2-2-1. Distribute calves on trial basis. Give technical guidance and monitor them to compile results.	Monitoring report		Tominaga, Hara	All technical experts		
		2-2-2. Examine recycling and sharing methods practiced at cattle colonies and farmers in the region.	Survey report		Tominaga, Hara	All technical experts		(completed in the 2nd year)
		2-2-3. Examine microcredit, other financial resources and other related organizations.	Activity report		Hara	All technical experts		
	2-3. Prepare the application plan for utilizing livestock resources	2-3-1. Compile plan for utilizing calves.	Guideline		Tominaga, Hara	All technical experts		
		2-3-2. Compile plan for utilizing dry buffalo.	Guideline		Tominaga, Hara	All technical experts		
	2-4. Conduct and analyze the applications	2-4-1. Pilot plan for utilizing calves and evaluate.	Guideline		Tominaga, Hara	All technical experts		
		2-4-2. Pilot plan for utilizing dry buffalo and evaluate.	Guideline		Tominaga, Hara	All technical experts		
	2-5. Apply the identified methods to the farmers	2-5-1. Apply calf utilization plan to the farmers.	Guideline		Tominaga, Hara	Tominaga, Ikegaya, Kawamoto, Hara		
		2-5-2. Apply dry buffalo utilization plan to the farmers.	Guideline		Tominaga, Hara	Tominaga, Ikegaya, Kawamoto, Hara		
	2-6. Monitor and evaluate the application of the identified methods	2-6-1. Compile the result of application of calf utilization method at farmers.	Activity report		Tominaga, Hara	Tominaga, Kawamoto, Hara		
		2-6-2. Compile the result of application of dry buffalo utilization method at farmers.	Activity report		Tominaga, Hara	Tominaga, Kawamoto, Hara		
	2-7. Prepare the guideline of utilizing livestock resources	2-7-1. Compile the guideline for calf utilization methods.	Guideline		Tominaga, Hara	All technical experts		
		2-7-2. Compile the guideline for dry buffalo utilization methods.	Guideline		Tominaga, Hara	All technical experts		

:Plan indicated in the Work Plan : Progress

Outputs	Activities		Expected Results	2017											2018		Responsible Person	Implementers	Major equipment and facilities	Remarks
				28	FY29															
				4th year																
				3	4	5	6	7	8	9	10	11	12	1	2					
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts.	3-1. Prepare the extension plan	-	Extension plan (Extension Guideline) ver.1														-	-		(completed in the 2nd year)
	3-2. Prepare the extension materials	-	Extension Material ver.1														-	-		(completed in the 2nd year)
		-	Extension Material ver.2																	(completed in the 3nd year)
		3-2-3. Prepare the extension materials based on the monitoring results of the extension activities	Extension Material ver.3														Kawamoto	Kawamoto, Extension C/P		
	3-3. Conduct trainings for the master trainers and extension workers including women	–	Results of the exam, recruitment criteria														Okabe	Okabe, Tominaga, Hara		(completed in the 1st year)
		3-3-5. Monitor the recruitment process of the Livestock Department	Allocation of the project staff as described in the PC-1														Okabe	Okabe		10 Female EWs
		3-3-6. Prepare the training plan of the master trainers and extension workers	Training plan including both technical and non-technical aspects														Kawamoto	Kawamoto		
		3-3-7. Train the master trainers and extension workers	Capacity of master trainers and extension workers enhanced														Kawamoto	Kawamoto, Extension C/P		
		3-3-8. Evaluate the results of the training	Results of the evaluation of the training														Kawamoto	Kawamoto, Extension C/P		
	3-4. Conduct extension activities for farmers	3-4-1. Identify the target farmers for disseminating the technologies and organize them into groups	Farmer groups organized (pilot farmers)														Kawamoto	Okabe, Tominaga, Kawamoto, Hara		(completed in the 3rd year)
			Farmer groups organized (neighboring farmers)														Kawamoto	Kawamoto, Extension C/P, Extension Team		
		3-4-2. Disseminate appropriate technologies to the farmers	Dissemination of the technologies (pilot farmers)														Kawamoto	Kawamoto, Extension C/P, Extension Team		Including follow-up and extension activity for female farmers
			Dissemination of the technologies (neighboring farmers)														Kawamoto	Kawamoto, Extension C/P, Extension Team		
	3-5. Monitor and evaluate the extension activities	3-5-1. Prepare the monitoring plan	Monitoring plan														Kawamoto	Kawamoto		
		3-5-2. Monitor the extension activities regularly	Monitoring data														Kawamoto	Kawamoto, Extension Team		
		3-5-3. Evaluate and compile the monitoring results	Report on extension activities														Kawamoto	Kawamoto		
	3-6. Review and revise the extension plan and materials	3-6-1. Review and revise the extension plan and materials	Extension plan (Extension Guideline) 3rd draft, extension materials 3rd draft														Kawamoto	Kawamoto		

:Plan indicated in the Work Plan : Progress

Outputs	Activities		Expected Results	2017										2018		Responsible Person	Implementers	Major equipment and facilities	Remarks
				28	FY29														
				4th year															
				3	4	5	6	7	8	9	10	11	12	1	2				
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-1. Prepare operation guidelines for the Project including project management, information sharing, coordination, etc.	–	The first draft of operation guidelines													Okabe	Okabe, Sarwar		(completed in the 1st year)
	4-2. Conduct training for project planning, management and monitoring	–	The questionnaire for the Training Needs Assessment, the result for the Training Needs Assessment													Okabe	Okabe, Sarwar		(completed in the 1st year)
		–	Receipt of proposals from the training institute, the proposal assessment criteria, The training institute selected for sub-contract													Okabe	Okabe		(completed in the 1st year)
		–	MOU with the JICA Non-formal Education Promotion Project on implementation of the training													Okabe	Okabe		(completed in the 1st year)
		4-2-1. Hold a meeting with CBU members, explain the training plan and develop a consensus	Training plan, meeting minutes													Okabe	Okabe, Yugeta, Sarwar, CBU		
		4-2-2. Conduct a needs assessment of the Department officers though CBU and make a list of training themes (draft)	List of training themes (draft)													Okabe	Okabe, Yugeta, Sarwar, CBU		
		4-2-3. Hold two or three consultation meetings, develop a consensus on the training plan and report/discuss the progress of "Actions" of training participants	Meeting minutes													Okabe	Okabe, Yugeta, Sarwar		
		4-2-4. Finalize the training themes	List of training themes (final)													Okabe	Okabe, Yugeta, Sarwar		
		4-2-5. Discuss and prepare the training work plan with the training institute (IRM) and conclude the contract	Training work plan, contract													Okabe	Okabe, Yugeta, Sarwar		
		4-2-6. Support bidding process of the Department for trainings to be implemented under the PC-1 budget	Training institute selected													Okabe	Okabe, Yugeta, Sarwar		
		4-2-7. CBU selects training participants	Training participant list													Okabe	Okabe, Yugeta, Sarwar, CBU		
		4-2-8. Conduct Basic Skill Trainings as per the finalized training themes	Results of post-exams, List of training completed participants													Sarwar	Okabe, Yugeta, Sarwar		
		4-2-9. Select master trainer candidates from the raining participants and other Department officers.	List of master trainer candidates													Okabe	Okabe, Yugeta, Sarwar, CBU		Not implemented due to the delay in tender process under the PC-1 budget
		4-2-10. Conduct Master Trainer Trainings	Result of participant evaluation, list of certified master trainers													Okabe	Okabe, Yugeta, Sarwar		Not implemented due to the delay in tender process under the PC-1 budget
		4-2-11. "Actions" will be carried out by the participants after the trainings. CBU monitors the progress of their "Actions"	"Actions" carried out by the training participants													Okabe	Okabe, Yugeta, Sarwar, CBU, Training Participants		
		4-2-12. Compile the feedbacks from the participants and the results of pre-exams and post-exams	Summary of results of pre- and post-exams and training feedbacks													Okabe	Okabe, Yugeta, Sarwar		

:Plan indicated in the Work Plan : Progress

Outputs	Activities		Expected Results	2017										2018		Responsible Person	Implementers	Major equipment and facilities	Remarks
				28	FY29														
				4th year															
				3	4	5	6	7	8	9	10	11	12	1	2				
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-2. Conduct training for project planning, management and monitoring	4-2-13. Finalize products from the trainings such as SOPs, together with training participants	Training products													Okabe	Okabe, Yugeta, Sarwar, Training Participants		
		4-2-14. Review the results of the trainings and "Actions" with the training participants and CBU members and reflect them into the next year's plan and further "Actions"	Next year's training plan (draft)													Okabe	Okabe, Yugeta, Sarwar, CBU, Training Participants		
		4-2-15. Hold a training closing ceremony and give certificates to the participants	Certificate of training completion, Certificate of training attendance													Okabe	Okabe, Yugeta, Sarwar		
		4-2-16. Hold a wrap-up meeting with IRM and discuss lessons learnt and points to be improved for the next year's trainings	Lessons learnt and points to be improved													Okabe	Okabe, Yugeta, Sarwar		
	4-3. Establish a livestock development platform for coordination and information sharing among stakeholders	4-3-1. Confirm the venue, participants, and the agenda of Livestock Development Platform	The program (the venue, the invitation list, and the agenda) of Livestock Development Platform													Okabe	Okabe, Sarwar		
		4-3-2. Hold a consultation meeting with the Livestock Department policy makers (D/G and Directors) to explain, discuss and reach a consensus about the contents of Livestock Development Platform	Deepened understanding of the Livestock Department policy makers on the contents of Livestock Development Platform													Okabe	Okabe, Sarwar		
		4-3-3. Hold Livestock Development Platform in December or in January	The participant list, the meeting minutes													Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara, Yugeta		
		4-3-4. Reflect the results of the meeting into the next year's activity plan	Reflection to Work Plan													Okabe	Okabe, Ikegaya, Tominaga, Kawamoto, Hara, Yugeta		
	4-4. Review and revise the guideline	-	Taskforce member list													Okabe	Okabe		(completed in the 2nd year)
		Refer to Activity 4-2																	
		4-4-7. Revise the guideline based on the review of the actions	Guideline 2nd draft													Okabe	Okabe, Sarwar		

:Plan indicated in the Work Plan : Progress

Attachment 3-1 Assignment of JICA Experts for the First Year

	Name	Subject	2014 2	3	4	5	6	7	8	9	10	11	12	2015 1	2	M/M Pakistan	M/M Japan
Pakistan	Hiroshi OKABE	Team Leader / Institutional Development	24 7 (12)			10 23 (14)			19 27 (9) 6 21 (16)		21 2 (13)	23 29 (7)		11 31 (21)		92 (3.07)	
	Fumiko IKEGAYA	Deputy Team Leader / Marketing / Farm Management2	24 7 (12)		21 23 (33)				19 26 (39)		12 25 (14)	13 19 (7)		11 1 (22)		127 (4.23)	
	Hideo TOMINAGA	Livestock Technology Development 1	24 9 (45)			6 20 (46)			12 29 (49)		14 23 (58)	3 19		11 1 (22)		220 (7.33)	
	Teruo SUGIWAKA	Livestock Feeding Management				10 16 (38)					21 24 (35)					73 (2.43)	
	Shinsuke KOBAYASHI	Fodder				6 16 (42)					14 24 (42)					84 (2.80)	
	Kazuhiro ONO	Animal Health / Animal Reproduction 1										29 19 (21)				21 (0.70)	
	Yoshitaka NAGAMINE	Genetic Improvement 1														0 (0.00)	
	Yoshio CHIBA	Genetic Improvement 2							30 29 (31)			8 28 (21)				52 (1.73)	
	Mika KAWAMOTO	Livestock Extension ／ Gender				10 7 (59)			30 19 (51)			25 12 (18)		11 4 (22)		150 (5.00)	
	Yukio IKEDA	Farm Management 1														0 (0.00)	
	Haruka RYU	Training Management	24 9 (45)			6 15 (41)			19 12 (Company cost)		21 28 (39)					125 (4.17)	
	Noriko HARA	Livestock Technology Development 2 ／ Coordination							19 12 (25)		14 19 (58)			11 1 (22)		105 (3.50)	
															Total (Pakistan)	1,049 (34.96)	
																34.96	2.85
																37.81	

	Name	Subject	2014											2015		M/M	
			2	3	4	5	6	7	8	9	10	11	12	1	2	Pakistan	Japan
Japan	Hiroshi OKABE	Team Leader / Institutional Development											4	2			6 (0.30)
	Fumiko IKEGAYA	Deputy Team Leader / Marketing / Farm Management2							2					3			5 (0.25)
	Hideo TOMINAGA	Livestock Technology Development 1							6				2	2			10 (0.50)
	Teruo SUGIWAKA	Livestock Feeding Management											4				4 (0.20)
	Shinsuke KOBAYASHI	Fodder											4				4 (0.20)
	Kazuhiro ONO	Animal Health / Animal Reproduction 1											2				2 (0.10)
	Yoshitaka NAGAMINE	Genetic Improvement 1											2				2 (0.10)
	Yoshio CHIBA	Genetic Improvement 2											2				2 (0.10)
	Mika KAWAMOTO	Livestock Extension ／ Gender												4			4 (0.20)
	Yukio IKEDA	Farm Management 1											10				10 (0.50)
	Haruka RYU	Training Management												4			4 (0.20)
	Noriko HARA	Livestock Technology Development 2 ／ Coordination												4			4 (0.20)
															Tota (Japan)		57 (2.85)

Attachment 3-2 Assignment of JICA Experts for the Seond Year

	Name	Subject	2015 2	3	4	5	6	7	8	9	10	11	12	2016 1	2	MM Total Pakistan	MM Total Japan
Pakistan	Hiroshi OKABE	Team Leader / Institutional Development		2 13 12		26 9 15			23 20 29			29 18 20		17 31 15		91 (3.03)	
	Fumiko IKEGAYA	Deputy Team Leader / Marketing / Farm Management2			5 29 55 12 - 18 April India							24 15 23 28 18 21				99 (3.30)	
	Hideo TOMINAGA	Livestock Technology Development 1		2 24 54	12 - 18 April India	25 12 49			17 7 52		2 20 49			11 31 21		225 (7.50)	
	Teruo SUGIWAKA	Livestock Feeding Management		21 24 35								12 16 35				70 (2.33)	
	Shinsuke KOBAYASHI	Fodder		11 24 45							2 16 45					90 (3.00)	
	Kazuhiro ONO	Animal Health / Animal Reproduction 1				25 21 28						28 18 21				49 (1.63)	
	Shigehisa TSUMAGARI	Animal Health / Animal Reproduction 2							17 30 14							14 (0.47)	
	Yoshitaka NAGAMINE	Genetic Improvement 1									Videz Jose Roca Nazario / Animal Repr 30	7 (39 days)				0 (0.00)	
	Yoshio CHIBA	Genetic Improvement 2					13 12 30				2 4 33					63 (2.10)	
	Teruo KAWAMURA	Genetic Improvement 3 / Livestock Feeding Management 2										28 8 20 11				11 (0.37)	
	Mika KAWAMOTO	Livestock Extension ／ Gender				4 26 54			17 20 35		3 18 66			11 7 21		176 (5.87)	
	Yukio IKEDA	Farm Management 1										28 13 16				16 (0.53)	
	Haruka RYU	Training Management							17 6 21 (Ryu)			12 18 (Yugeta)		17 31		21 (0.70)	
	Noriko HARA	Livestock Technology Development 2 ／ Coordination		2 20 50	12 - 18 April India	1 10 40			2 8 37		2 18 47			16 31 16		190 (6.33)	
															Total in Pakistan	1,115 (37.17)	

<Legend> Activities in Pakistan Consultant Own Expenses

	Name	Subject	2015											2016		MM Total	
			2	3	4	5	6	7	8	9	10	11	12	1	2	Pakistan	Japan
Japan Japan	Fumiko IKEGAYA	Deputy Team Leader / Marketing / Farm Management2												10			10 (0.50)
	Yoshitaka NAGAMINE	Genetic Improvement 1											4				4 (0.20)
															Total in Japan		14 (0.70)

Attachment 3-3 Assignment of JICA Experts for he Third Year)

	Subject	Name	2016 2	3	4	5	6	7	8	9	10	11	12	2017 1	2	3	MM Total Pakistan	Japan
Pakistan	Team Leader / Institutional Development	Hiroshi OKABE		27 5 10		22 5 15		31	28 29			29	18 20	15 29 15			89 (2.97)	
	Deputy Team Leader / Marketing / Farm Management 2	Fumiko IKEGAYA									2 8 7	27 11 15		14 29 16			38 (1.27)	
	Livestock Technology Development 1	Hideo TOMINAGA		7 20 45		11 27 48		31	17 22 Hoof-cutting Expert	63	7	24 27 10 4 Thailand	18 39	10 31 22			221 (7.37)	
	Livestock Feeding Management 1	Teruo SUGIWAKA		17 20 35													35 (1.17)	
	Fodder	Shinsuke KOBAYASHI							3 10 39			29	18 51				90 (3.00)	
	Animal Health / Animal Reproduction 1	Takeshi ABE				11 5 26							28 18 21				47 (1.57)	
	Animal Health / Animal Reproduction 2	Shigehisa TSUMAGARI							22 4 14								14 (0.47)	
	Genetic Improvement 1	Yoshitaka NAGAMINE															0 (0.00)	
	Genetic Improvement 2	Yoshio CHIBA		7 5 30					31	2 33							63 (2.10)	
	Livestock Feeding Management 2	Teruo KAWAMURA										15 18 34					34 (1.13)	
	Livestock Extension / Gender	Mika KAWAMOTO		17 5 81				10 28 50			8 6 18 60		12	14 28 23 15 26			206 (6.87)	
	Farm Management 1	Yukio IKEDA										8 22 15					15 (0.50)	
	Training Management	Kodai YUGETA		20 5 17		25 5 12		24 10 8 31		10		20 18	29	10 29 20			0 (0.00)	
	Livestock Technology Development 2 / Coordination	Noriko HARA		7 15 40		18 24 38		31 19 20	17	7 21	24 27 4 Thailand	9	18 40	14 30 17			180 (6.00)	
																Total in Pakistan	1,032 (34.40)	0 (0.00)

<Legend> Activities in Pakistan Consultant Own Expenses

	Subject	Name	2014											2015			MM	
																	Total	
			2	3	4	5	6	7	8	9	10	11	12	1	2	3	Pakistan	Japan
Japan	Team Leader / Institutional Development	Hiroshi OKABE											5	5				10 (0.50)
	Deputy Team Leader / Marketing / Farm Management 2	Fumiko IKEGAYA						2	2	5			10	6	2 3			30 (1.50)
	Genetic Improvement 1	Yoshitaka NAGAMINE											4					4 (0.20)
																Total in Japan		44 (2.20)

Attachment 3-4 Assignment of JICA Experts for the Fourth Year

	Title	Name	2017										2018			MM	
																Total	
			3	4	5	6	7	8	9	10	11	12	1	2	3	Pakistan	Japan
Pakistan	Team Leader / Institutional Development	Hiroshi OKABE	25 12 5		15 14 28			1 13		11 12 22		26 22 17	14 21 3			94 (3.13)	
	Deputy Team Leader / Marketing / Farm Management 2	Fumiko IKEGAYA			13 16 28		6 17 22						14 15 28			48 (1.60)	
	Livestock Technology Development 1	Hideo TOMINAGA		5 47 21			1 30 30	27 39	4	21 58		17	10 25 3			199 (6.63)	
							Third country expert (Andrology) ##		4 (39 days)								
	Fodder	Shinsuke KOBAYASHI		5 30 4							5 28 2					58 (1.93)	
	Animal Health / Animal Reproduction 1	Takeshi ABE					6 25 30				5 25 29					50 (1.67)	
	Animal Health / Animal Reproduction 2	Shigehisa TSUMAGARI						28 14 10								14 (0.47)	
	Genetic Improvement 1	Yoshitaka NAGAMINE														0 (0.00)	
	Genetic Improvement 2	Yoshio CHIBA		5 25 29							12 27 8					52 (1.73)	
	Livestock Feeding Managemen	Teruo KAWAMURA		5 25 ##							36					61 (2.03)	
	Livestock Extension / Gender	Mika KAWAMOTO	29 71 7				8 9 16 19 57	13		4 18 21	2 10 11 18 18 5 14 10 23		11 17 27	4 26 1		240 (8.00)	
	Farm Management 1	Yukio IKEDA										9 15 23				15 (0.50)	
	Training Management	Kodai YUGETA	25 12 5		15 21 28			23 22 13				26 22 17	10 17 26			0 (0.00)	
	Livestock Technology Development 2 / Coordination	Noriko HARA		3 7 9 18	40 27		1 17 17 25 11 4		4 5 8 20 25	14	4 8 11 18 30	17	13 23	1 4 15 22 21		165 (5.50)	
															Total in Pakistan	996 (33.19)	0 (0.00)

<Legend> Activities in Pakistan Consultant Own Expenses

	Title	Name	2017										2018			MM	
																Total	
			3	4	5	6	7	8	9	10	11	12	1	2	3	Pakistan	Japan
Japan	Deputy Team Leader / Marketing / Farm Management 2	Fumiko IKEGAYA	3	3									5	4			15 (0.75)
	Genetic Improvement 1	Yoshitaka NAGAMINE									4						4 (0.20)
	Training Management	Kodai YUGETA						15	Training in Japan 45	29							0 (0.00)
	Livestock Technology Development 2 / Coordination	Noriko HARA															0 (0.00)
															Total in Japan		19 (0.95)

<Legend> Activities in Pakistan Consultant Own Expenses

Attachment 3-5-1 Assignment of JICA Experts for the Fifth year (March 2018-February 2019)

	Name	Rank	No. of Trips	2018 3	4	5	6	7	8	9	10	11	12	2019 1	2	3	Days	Months
Pakistan	Hiroshi Okabe (Team Leader / Institional Development)	1	5			9 15 23		29 3 7	7 9 25	9	10 14 23	25 6 8		14 18 31			87	2.90
	Fumiko Ikegaya (Deputy Team Leader / Marketing / Farming Management 2)	3	2				24 7 7	7				25 6 8		14 17 30			45	1.50
	Hideo Tominaga (Appropriate Technology Development 1)	2	3	18 14 30	1 1		26 5 31		31 9	9		15 16 16	16	13 19 31			172	5.73
	Shinsuke Kobayashi (Fodder)	3	2	19 13 19	19			28 4 22	22								58	1.93
	Takeshi Abe (Aninamal Health / Reproduction 1)	4	2				26 5 22	22				16 15 16	16				58	1.93
	Shigehisa Tsumagari (Aninamal Health / Reproduction 2)	4	0														0	0.00
	Yoshitaka nagamine (Genetic Improvement 1)	3	0														0	0.00
	Yoshio Chiba (Genetic Improvement 2)	3	2	19 13 12	12							16 15 12	12				52	1.73
	Teruo Kawamura (Feeding Management)	4	2	19 13 23	23			1 25	25								61	2.03
	Mika Kawamoto (Extension / Gender)	4	5	22 10 30	16 16		25 6 14	14	3 29	9 9	10 22	31 25 6	23 23	12 15	26		180	6.00
	Yukio Ikeda (Farming Management 1)	3	1									16 15	30				15	0.50
	Kodai Yugeta (Training Management)	5	3			9 15 23					10 14 23	29 1 9	9	13 18 30			57	1.90
	Noriko Hara (Appropriate Technology Developmen 2 / Administration)	5	4	17 15 13	13		20 11 22	22	11 21 9	9		11 20 15	15	10 10 8	30		144	4.80
												Pakistan			Subtotal		929	30.95

Assignment Schedule in Japan

	Name	Rank	No. of Trips	2018 3	4	5	6	7	8	9	10	11	12	2019 1	2	3	Days	Months
Japan	Hiroshi Okabe (Team Leader / Institional Development)	1	-					3							3		6	0.30
	Fumiko Ikegaya (Deputy Team Leader / Marketing / Farming Management 2)	3	-					3							3		6	0.30
	Shigehisa Tsumagari (Aninamal Health / Reproduction 2)	4	-											4			4	0.20
	Yoshitaka nagamine (Genetic Improvement 1)	3	-											4			4	0.20
												Japan			Subtotal		20	1.00
															Total		949	31.95

Attachment 3-5-2 Assignment of JICA Experts for the Fifth Year (March 2019-August 2020)

	Name (Title)	Rank	No. of Trips	2019 3	4	5	6	7	8	9	10	11	12	2020 1	2	3	4	5	6	7	8	Days	Months
Pakistan	Hiroshi Okabe (Team Leader / Institional Development)	1	0			19 13 1				25 6 5			2 13 14			3 12 14						50	1.67
	Hideo Tominaga (Appropriate Technology Development 1)	2	0	17 14 30				24 8 3		30 1 12						9 12 20						50	1.67
	Mika Kawamoto (Extension / Gender)	4	0				16 15 30			15 13 27			10 13 22					25 5 8				54	1.80
	Kodai Yugeta (Training Management)	5	0	17 15 31		19 12 30		22 10 1		2 10 11												48	1.60
																Pakistan					Subtotal	202	6.74

Assignment Schedule in Japa

	Name (Title)	Rank	No. of Trips	2019 3	4	5	6	7	8	9	10	11	12	2020 1	2	3	4	5	6	7	8	Days	Months
Japan	Hiroshi Okabe (Team Leader / Institional Development)	1	-	2				3			2							5	5	5	6.6	29	1.43
	Hideo Tominaga (Appropriate Technology Development 1)	2	-	2				1			1							3	3	3	2.3	15	0.77
	Mika Kawamoto (Extension / Gender)	4	-					3			1							3	3	3	2.3	15	0.77
	Kodai Yugeta (Training Management)	5	-	2				1			1							5	5	5	4.3	23	1.17
																		Japan			Subtotal	83	4.14
																		Total				285	10.88

Attachment 3-5-3 Assignment of JICA Experts for the Fifth Year (September 2020-September 2021)

	Name (Title)	Rank	No. of Trips	2020				2021									Days	Months
				9	10	11	12	1	2	3	4	5	6	7	8	9		
Pakistan	Hiroshi Okabe (Team Leader / Institional Development)	1	0														0	0.00
	Hideo Tominaga (Appropriate Technology Development 1)	2	0														0	0.00
	Mika Kawamoto (Extension / Gender)	4	0														0	0.00
	Kodai Yugeta (Training Management)	5	0														0	0.00
										Pakistan						Subtotal	0	0.00

Assignment Schedule in Japan

	Name (Title)	Rank	No. of Trips	2020				2021									Days	Months
				9	10	11	12	1	2	3	4	5	6	7	8	9		
Japan	Hiroshi Okabe (Team Leader / Institional Development)	1	-			3	7	7	7	3	3	4	4	4	2		44	2.20
	Hideo Tominaga (Appropriate Technology Development 1)	2	-			6	11	11	10	7	5	6	6	2			64	3.20
	Mika Kawamoto (Extension / Gender)	4	-			5	11	11	9	6	7	2	3		5		59	2.95
	Kodai Yugeta (Training Management)	5	-			3	9	8	7	4	2	4	4		2		43	2.15
										Japan						Subtotal	210	10.50
										Total							210	10.50

Attachment 4-2 Third Country Training Completion Report

Report on Exposure Visit to Thailand

Under the Project on Sustainable Livestock Development for Rural Sindh

September 2017

A team of Pakistani Counterparts of the Project

Table of Contents

Executive Summary

The exposure visit to Thailand was organized under the Project on Sustainable Livestock Development for Rural Sindh (The Project) implemented in collaboration with Livestock Department, Sindh, Government of Pakistan and Japan International Cooperation Agency, Government of Japan.

The objectives of the visit were to learn Thailand's 50 years' daily sector development, especially activities of daily cooperatives, technical services provided to dairy farmers at their door step and calf rearing so that the Project could have suggestions on the current activities.

9 veterinary officers from the livestock departments (the counter parts of the Project), 3 Japanese experts and 2 Thai coordinators joined the exposure visits. In 9 days, the participants visited 9 places ranging from central and provincial livestock department to small scale farmers.

The history and background of dairy sector development in Thailand are different from that in Pakistan. Preconditions including size of farms, educational background of farmers, food culture and climate were different as well. Meanwhile, the remarkable development of the dairy sector within a short period was impressive to the participants.

Development of cooperatives on trial basis, strengthening of existing training institutes for extension activities for farmers, cultivating multi-cut grasses, silage, TMR production, development of full-fledged laboratory for feed, fodder, milk quality control and development of different calf rearing model were suggested by the participants for further consideration for application in the Project area.

The participants and the Project will further examine the possibility of the above activities to be applied in the Project area in future.

1. Background

The Livestock sector in Pakistan is a backbone of Pakistan's economy, and it contributes about half of Agricultural GDP, which is around 10% of total GDP of the country. Pakistan is one of the world prominent countries in terms of the livestock population and production of milk. 'The Project on Sustainable Livestock Development for Rural Sindh' (The project) is the technical cooperation project in collaboration with Japan International Cooperation Agency (JICA), Government of Japan and the Livestock and Fisheries Department, Government of Sindh, Pakistan. This 5- year project has started in February 2014. In the 4th year of the project period, an exposure visit to Thai dairy sector was planned for Pakistani Counterparts in 9 fields to learn dairy sector development of the country who had similar climate and environment to Pakistan. It was expected that the Pakistani Counterparts could learn from their experience and apply any practices which were feasible and useful for the country.

2. Objectives of the visit

- To learn experiences of development of dairy sector in the third country where similar climatic environment are found
- To obtain ideas for the project activities of technology development and extension services

3. Topics for the visit

Thailand's 50 years' daily livestock development history had started from scratch. Nevertheless, the country achieved remarkable success within a short period of time. Widespread and efficient cooperative organizations are the outstanding feature in the dairy sector development of Thailand. The organized dairy sector comprised of government department, private enterprises and dairy famers' cooperative is also good examples to learn.

Topics to be studied during visits planned by the Japanese expert, thus, initially included followings;

- The policy and strategy of livestock sector development in Thailand
- Feeding management, management of milking, calf rearing, animal reproduction, prevention of disease, genetic improvement and dairy product processing in Thailand
- History of dairy cooperatives in Thailand
- Case study of milk marketing and collective sales of milk by milk cooperatives
- Technical services to small scale dairy farmers by dairy cooperatives
- Technical services to small scale dairy farmers by local livestock offices

4. Overview of the visit

Overview of the visit was as follows;

- Period: from 13 May 2017 (Sat.) till 21 May 2017 (Sun.), 9 days in total
- Participants: 9 numbers of Pakistani counterparts, 3 numbers of Japanese experts and 2 Thai Coordinator (Participants list are attached in the annex.)
- Organization visited:
    - Department of Livestock Development, Ministry of Agriculture and Cooperative
    - Dairy Farming Promotion Organization of Thailand, Saraburi Province
    - Feed and Nutrition Center, Nakorn Rachashima Province
    - Thai Milk Cooperative, Saraburi Province
    - Mittraparb Milk Cooperative in Saraburi Province
    - Murrah Farm, Chachengsao Province
    - Small scale farmers in Saraburi Province

5. Minutes

- Record of each visit was made in the form of minutes -

I. Orientation Session

May 14, 2017

Activity: Orientation (General) Knowledge about Thailand, Travelling trips, explanation about schedule about overview of Livestock sector in Thailand.

Purpose: 1) To understand the overview of livestock sector in Thailand.
2) To receive orientation about country and programme.

Facilitator: Dr. Ghulam Muhammad Jiskani.
Minute's Taker: Dr. Naeem Siddique Ansari.

The meeting started from 10:30AM at Novotel hotel meeting hall Bangkok and finished at 14:00PM.

The meeting started with the Recitation of Holy Quran by Dr Arif. Dr Jiskani presented Sindhi Topi, Dr. Iqtidar presented Ajrak and Dr. Mubarak presented '*Shah Jo Risalo*' of English version to Dr. Rangsun.

Dr. Jiskani Welcome to all participants. All participant introduced themselves.

Dr. Rangsun welcomed all the participants to Thailand hoping they would learn about Thai livestock sector and would increase their experience. He thanked JICA project for arranging this trip. He shared his experience in Pakistan when he visited there in 2012. He mentioned that he was surprised to see big milking buffalo farms and al buffaloes were manually milked.

[General Knowledge about Thailand, Travelling tips]
Dr. Tatawat, local coordinator gave presentation on 'General Knowledge about Thailand, Travelling tips' (presentation material was attached as Annex) which provided the information on the country's geographical information, traveling attraction, transportation system, food, popular tourist destinations, ethnic background of people and so on.

[DVM education system in Thailand]
Following the presentation of general knowledge of Thailand, Dr. Tatawat gave the presentation 'How many institutions providing degree/diploma for veterinarians in Thailand' (presentation material was attached) which explained about history, list of institutes, location of veterinary

technology institutions.

Since 1957, Veterinary course has been 6 years of education. For 4 years bachelor degree, degree holder can work as an Assistant of Veterinary Doctor. There is no 2 years para-vet system in Thailand. Before 1957, DVM program was 4 to 5 years of educations.

In response to the question of Dr. Mubarak that how people cope with the situation when no 6 years educated veterinary doctors are available in areas, Dr. Rangsun replied that every provincial livestock office has enough number of veterinary doctors. The ratio of animals per veterinary doctors were not available at the time of presentation but Dr. Rangsun told that 500 DVM and 200 animal scientists are graduated every year. Out of them 20% are engaged with Government jobs and 80% of them open private clinics.

[Overview of Livestock Sector in Thailand]

Dr. Rangsun gave presentation of 'Overview of Livestock Sector in Thailand' (presentation materials attached).

Q/A	By	Question/Answer
Q1	Dr. Mubarak	You work with Sahiwal breed not Red Sindhi, is there any reason?
Ans		We work with Red Sindhi, unfortunately not get good result.
Q2	Dr. Iqtadar	What is the ratio of Male/Female Livestock farmer?
Ans		The ratio is almost same.
Q3	Dr. Arif	99% milk comes from cattle and more meat comes from which animal?
Ans		80% meat comes from cattle and 20% comes from buffalo.
Q4	Dr. Rukhsana	Chicken is expensive or beef?
Ans		Chicken is not expensive i-e 100Bhat at shopping mall and beef have 300Bhat/Kg.
Q5	Dr. Iqtadar	What is the price of milk/liter?
Ans		Good quality of milk is 18.2 Bhat/liter, Fresh pasteurized milk is 40 Bhat/liter of cow milk and buffalo milk pasteurized is 80Bhat/liter.
Q6	Dr. Rukhsana	What is the by-product of buffalo milk?
Ans		Mozella Cheese, butter, ice cream.
Q7	Dr Zulfiqar	Fresh meat is more popular then frozen meat?
Ans		In rural area people like fresh meat but in urban area there is no chance to purchase fresh meat so they purchase frozen meat.

Q8	Dr Iqtadar	Any grading system of meat prevailing in Thailand?
Ans		Yes.

Finding:

- History of Livestock rearing is very short, i.e. 55 years.
- In short period 11 institutes were established.
- 500 doctors pass out in every year and 20% get job.
- 3.37 million people involve in livestock.
- Livestock sector provided employment to about 4.97% people.
- The definition of small scale farmer is different from our country.
- Grading system of beef meat is also prevailing.

II. Department of Livestock Development

May 15, 2017

Activity: Visit of the Department of Livestock Development, Ministry of Agriculture & Cooperative, Thailand.

Purpose: 1) To learn and grasp current situation of Department of Livestock Development as a Governmental organization.

2) To learn history and services which Department of Livestock Development provided to Dairy Farmers.

3) To Learn overview of dairy sector development in Thailand.

Facilitator: Dr. Ghulam Muhammad Jiskani

Minute's taker: Dr. Safdar Ali Fazlani

Each counterpart introduced themselves and briefs working area in the project.

[DLD services to Dairy Farmers]

Department of Livestock Development provides free of cost Vaccination Deworming, Frozen Semen doses for A.I & Trainings. Every Regional Office of DLD, arrange training and other organization can provide different trainings like Dairy Promotion Organization (DPO) and Cooperatives. Because DLD officers are not enough for arranging trainings everywhere but with the collaboration with DPO, Cooperatives and the other stakeholders.

[Registration of Animals]

All animals having ear tags and national ear tagging mechanism in the department.

[Disease control by DLD]

Positive case of brucellosis was very low in the country during last 5 years because using A.I.

If Government Announce compensation for brucellosis positive case in certain region, then government pays half amount to the farmer.

Eastern & Southern region of Thailand is FMD free region and other area has FMD disease.

Department of Livestock Development produce FMD (Strain A, O, Asia-1) and H.S vaccines.

[Loan and Insurance for Dairy Animals]

Since 5 years DLD convincing the dairy farmers to raising the cattle to increase milk production. In this regard government provide loan with very low interest rate that is 7% but only farmer pay 3.5% and half of 3.5% government pay.

If farmer have 100 head of cattle they can get loan up to 3 million baht. And government gave first 3 years grace period. During 4th year farmer starts to pay back.

No Animal Health Insurance policy in Thailand.

[Milk Production and Price, Quality control]

Co-operative 60% milk produce and 40% by the private sector.

For school milk program 1200 tons milk is consume that is 40% of total milk production per day.

14 liters milk/year/head.

Milk price was decided by National Dairy Board. There are four members in dairy board, 1-Cooperatives, 2- University, 3- Factory Owners, 4-Farmers.

Farm gate milk price is 17.5 baht /lit and factory gate price is 45 baht /lit.

FDA, Food and Drug Controlling Authority, is responsible to control the hygiene and good quality of milk in the country.

Findings:

- Coordination between Government (DLD) department and DPO, Cooperatives was well organized.
- Farmer role in the whole system was well defined and farmer takes responsibilities to ensure and avoid any malpractice during producing milk.
- DLD services to the farmer were smooth and role of DLD was supportive.
- National Dairy Board have signified role to decide the price of milk.
- FDA, control good quality and as well as hygiene of milk and milk by products.

Recommendation:

On behalf of findings I would like to strongly recommend that project should develop Dairy Promotion Organization and Co-operatives in Sindh.

III. Meat Market in Bangkok

May 15, 2017

Activity: Visit of Meat Market in Bangkok

Purpose: **1)** Physically visit of meat market to know and understand the mechanism of meat marketing in Thailand at Bangkok.

Facilitator: Dr. Iqtadar Ali Memon Livestock marketing specialist

Recorded by: Dr. Zulfiqar Ali Pathan Animal Health specialist

It was 1st experience to see different varieties of Meat, Fish, chicken, vegetables and fruits and also observed their cool chain system, packing and prices of meat and other food items available in the market.

There were different varieties of fresh meat, preserved meat and dry meat. Meat was selling out with different prices according to different parts of carcass i.e. Rib eye, lion back, strip loin, tender loin as per consumer's choice. Prices also vary according to different categories of meat like fresh dairy cattle @600 baht/kg, fresh beef cattle 450 baht/kg and dry meat 400 baht/kg.

The other portion of the market was comprised with different kinds of fresh vegetables and fruits which were kept under good management, hygienic environment and reasonable prices.

Pakistani counterparts first time seen and taste the king fruit of Thailand named "Dorian" its taste was bitter and total different from other fruits.

Pakistani counterparts also observed different varieties of mangoes that were very nice and delicious in taste shape and color which were little bit different from Pakistani mango varieties.

SUMMARY:

Market was well organized and there was hygienic environment and suitable storage of commodities under cool chain, fluctuation of rates was not observed on query from various shops, market was providing one window service for their buyers and consumers.

VI. Murrah Farm in Chachoengsao Province

May 16, 2017

Activity: Visited Murrah Farm in Chachoengsao Province

Purpose: **1)** To learn history of the Murrah farm in Thailand and how they established the Co-operative relationship with other organizations.

2) To learn how the Murrah baffalo are raised in Thailand (Feeding management, Fodder development, Calf rearing method, Breeding method, byproduct production, marketing).

Facilitator: Dr. Muhammad Mubarak Jatoi

Minute's taker: Dr. Ali Akhtar Shahani

Visiting team left hotel Novotel at 7:35am for the visit of Murrah Farm in Chachoengsao Province and arrived at 10:50am.

Owner of the Farm Madam Runchuan Hengtrakulsin welcome the team.

Each counterpart introduced themselves and briefs working area in the project.

[History of the Murrah Farm]

Madam Runchuan briefed to the team that before starting buffalo farming I was doing the business of skin and hides. Due to low profit and difficult to collect material I thought that, why I should not start other business. Buffalo farming was my own idea, to materialize my approach regarding rearing of Murrah buffalo I visited India, Italy and Brazil.

Murrah Buffalo farming was started in the year 2003 with the strength of 60 buffalo and at this time increased to 380 buffalo. Among 380 milking buffalo are 80 and 10 bulls are other are pregnant dry animal and young stock found at her farm. The numbers of workers working at this farm are 43, out of this 10 workers working in milk processing unit (Cheese making and pasteurizing milk units).

[Farm management]

Buffalo are rearing system is semi-intensive. Farm buildings constructed are looking good and ventilated and the number of workers and expenditure at farm is high and profit is very low due to this reason farm is going in loss. Murrah buffalo is riverine type enjoy bathing in running water but at this farm there was standing water for bathing which seems polluted and contains many parasites.

[Fodder development]

She possesses 70 hectares land area for this farm where she cultivates green fodder such as maize, millet, sorghum and natural.

[Calf rearing method]

Team observed different method of buffalo calves rearing at this farm as compared to Sindh province. After birth calf receives enough colostrum and separated from mother and put on bucket feeding of buffalo milk. Milking of buffaloes is by machine milking without using oxytocin or stimulation by using calf.

[Breeding method]

Breeding of buffalo is by natural. Bull is used at the ratio of 1:20 females.

[Byproduct production and marketing]

Total 250Kg Fresh milk produced at this farm, and here is small unit for pasteurizing and cheese making at this farm where 70% of total milk is pasteurized and sold door to door at the rate of ฿ 40 per 180ml and 30% milk used for making mozzarella cheese. The rate of mozzarella cheese at farm gate is ฿1200 per kg.

Madam Runchuan told that she is not happy with present condition of farm due to low production and economic loss. The body condition score of majority of buffalo is below 2. Age at first calving is five years this is due to late maturity. She told that there is less support from technicians and co-operatives working in the area. She request visiting counterparts for necessary guidance/advise to improve the animal condition and farm production.

Dr. GM Jiskani handover the manual of technology development prepared by PSLD Project team, all counterparts give guidance briefly about their subject mentioned in the manual and finally Dr. GM Jiskani briefs about the good management measures at her farm and advise the owner of this farm that if she follow the management practices according to manual, the farm production and profit will increase.

Findings:

- Buffalo milk rate was high compared to cow milk
- Production and sale of mozzarella cheese was encouraging
- Low milk production
- Weight gain during growing period very low
- Late age at maturity
- High numbers of worker working at farm
- Water for bathing was polluted
- No technical support to improve this farm

Recommendations:

- Project on improvement of buffalo production reproduction should be started with the collaboration of buffalo raising country.

VII. Bhombila Dairy Farm in Saraburi Province

May 16, 2017

Activity: Visited Bhombia Dairy Farm in Saraburi Province

Facilitator: Dr. Muhammad Mubarak Jatoi
Minute's taker: Dr. Ali Akhtar Shahani

[Visit of medium scale dairy farm - Bhombila Dairy Farm]

Mr. Sultan Shah living in Piaputtabart district of Saraburi province and running his Friesian cattle dairy farm comprises total 110 animals, out of which 45 are milking cows producing 450 liters milk per day, he sells his dairy milk at the rate of ฿20 at farm gate to Nestle company of milk processing.

Mr. Sultan purchased 25 hectares land seven years back (2010) at the rate of ฿192,000/hectares. Farmer did not grow fodder on his land and purchase silage at the rate of ฿50/30 kg and concentrate at the rate of ฿10/kg. Thai milk dairy Co-operative contacted with Mr. Sultan for registration but he yet not signed up the membership form. DLD staff carried preventive vaccination against FMD and HS diseases three times in a year. Government Veterinary Officer visits his farm on call. Artificial Insemination carried by AI technician at the rate of ฿100/cow. Mr. Sultan told that animal sickness percentage is higher in rainy season.

[Visit of Slaughter house]

Mr. Sultan has been running his slaughter house for 30 years under the license issued by DLD. About 12 peoples working at his slaughters house, receiving salary ฿ 8-15 thousands/month depending on nature of work. Mr. Sultan slaughter 10-15 animals/day five days in week. He purchases culled dairy animals from middle man at the rate of ฿150/kg carcass weight and sells boneless meat locally at the rate of ฿170/kg and ฿220/kg to Godeng and Namshai beef companies. Skin/hides are sold at the rate ฿20/kg and bones ฿0.50/kg. District Veterinary Officer examind body condition score and health status of animals and hygiene of slaughter house.

Visiting team takes the dinner at Mr. Sultan shah house thanks for his hospitality and return back to Hotel.

VIII. Thai Milk Cooperatives in Saraburi Province

May 17, 2017

Activity: Visit to Thai milk cooperatives in Lam Phaya Klang District of Saraburi Province along with Dairy Head Health Unit.

Purpose: 1) To learn how the district and sub district office support small scale farmers.

2) To learn how the cooperative work together (milk Collection, Fodder cultivation, cooperatives work support system Visiting milk chiller.

Facilitator: Dr. Rukhsana

Minutes taker: Dr. Muhammad Arif Khan

Visiting team left hotel Saraburi valley garden resort at 8:00 am for visit DLD, Thai milk Dairy Cooperative, herd health unit, milk collection center and Cattle farm which work with cooperative and arrived 9.30.am.

The chief of Thai milk dairy cooperative welcomed the team where DLD officers also present.

First Introduction of each counterpart by themselves and brief working area in project.

Dr. Jiskani thanked to Thailand DLD, Dairy milk cooperative and Dr. Rangsun for the arrangement.

One DLD officer show presentation (Their presentation material was attached in the Annex).

Goals of DLD are (healthy cow, increase 3 % milk per year, decrease calving interval 5days per year, increase profit of farmers) to achieve goals vaccination, treatment and training.

Representative of Thai milk Dairy cooperative gave presentation about their activities:

[History]

Dairy farming has been started before 1956, but dairy cooperative established in 1970, and registered cooperative on July 20, 1987 by Mr. Chawengsak sanuan- Wongvijit. He believed the cooperative system is best to help farmers in groups.

Initial 80 members and share capital 60,000 baht. Got fund from Ministry of Agriculture and Cooperative, 5 million baht for started the raw milk collection center. Currently they have milk collection center, dairy cattle feed mill, dairy processing plants (pasteurized and UHT milk) and supplies consumer goods, fuels as well as provides revolving loans for members.

[Activities of Cooperatives]

Presently total 108 registered dairy cooperatives and produced milk 1995 tons per day.
Cooperatives provide revolving loans for member farmers. Member Farmers supply 100% milk to cooperatives even farmer also used process milk. Cooperatives share Profit each member farmers at the end of year. Maize, Napire grass, Rice straw, Silage making, mostly TMR used supply by cooperatives. Cooperatives provide all needs of farmers to door step and farmers supply milk to cooperatives.

[Achievement]
Previously, the average milk production of the members was 11.39kg/head/day. Now the production increased as 13.08kg/head/day. The cooperative further tries to increase milk production up to 18kg/head/day. The production cost was THB 16.72 / kg before and now decreased to THB 15.50 / kg.

Following the presentations, questions were asked by the participants.

Q/A	By	Question/Answer
About Cooperatives		
Q1	Dr. Zulfiqar	What is the criteria for membership?
Ans		Good behavior & all milk must be sold to the cooperative
Q2	Dr. Jiskani	What kind of support gives to farmers?
Ans		The cooperative lends milking machine, sales TMR and provide AI services.
Q3	Dr. Jatoi	Is the profit of cooperative shared to farmers?
Ans		Profit of cooperative are shared to all members once a year.
Q4	Dr. Safdar	What is the most challenging issues for cooperatives?
Ans		To change thinking of farmers is most difficult.
Q5	Dr. Arif	What is the educational background of farmers?
Ans		Younger generation are more educated than old ones. Old ones mostly completed up to primary education.
Health Services by DLD		
Q1	Dr. Zulfiqar	In case of brucellosis positive case, what type of measures are taken?
Ans		If 1st test found it positive, isolate the infected animals. After 2 months, 2nd test is carried out. If it is found positive, those animals are culled and varied in 50cm depth and covered with lime stone.

Q2	Dr. Zulfiqar	What kind of compensations are given to farmers when it needs to be culled?
Ans		Mostly no compensations are given to farmers. If governor announces it, some compensations are provided.
Q3	Dr. Zulfiqar	One needle for one animal is used for vaccination?
Ans		Yes, one needle is used for only one animal.
Q4	Dr. Arif	What kind of disease are common?
Ans		Parasites, anaplazmosis and babisia
Q5	Dr. Iqtadar	What kind of support extended by DLD to farmers?
Ans		Free vaccination, free disinfection solution and free biogas unit.
Loans to famers		
Q1	Dr. Arif	What is the interest rate of loan to farmers?
Ans		In case of loans used for daily consumption, the rate is 12%. For enlarging production, 3% and for large scale 9%. For the emergency loans, the rate is 12%. Government subsidies the interest cost.
Calf Rearing Cost of the cooperative farms		
Q1	Dr. Naeem	What is the calf rearing cost at the cooperative farm?
Ans		The cooperatives purchase 2 months sucking calf from farmers at the cost of 3,000 THB. At the 6 months pregnancy, it is sold around 50,000 THB to farmers (suppose the rearing cost is 40,000 THB). The price is fixed depending on the cost of rearing.

[Feed Mill visit]

After Thai milk cooperative office, we visit feed mill where TMR preparation, silage bankers.
If CP is 21% 10 Baht /kg. More than 10 formula feed using in feed mill.
They have own Lab for analysis.

[Milk collection and processing center]

First milk measurement then test analysis process UHT and pasteurized packing.
This center has120 to130 tons milk /day.

[A Farm visit]

A cattle farm visit which working with cooperative. When team arrive farm plastic cover provide to team for shoe and mask for mouth, Dip shoe in disinfection solution. 2 years before this farm established and feeding TMR and rice straw, mostly work with machine cleaning, milking etc. Total number 230 animals. 8 workers and 3 technicians work in this farm. Salary of one worker is 15,000 baht. 100 % A.I. done at this farm.
Visiting team back 17:00 pm hotel at Saraburi valley garden resort.

Finding:

- Good collaboration of DLD, Cooperatives and farmers.
- All are sincere and make a successful achievement in short time.
- Its Public private partnership. And after cooperative independent financially run successfully dairy business.
- Hygienic milk used by consumer's even farmers.

Recommendations:

- First make small groups of farmers, registration of members, provide feed, vaccination, treatment chiller and then collect their milk make good marketing system.
- Provide facility to door step for farmers.
- Small and medium scale farmer's work together to make cooperative system.
- With the help of Allah and hard work we shall make a good cooperative model which help to extended all Sindh to increase milk production not only for Sindh but also export to other province and countries.

IX. Dairy Farming Promotion Organization of Thailand

May 18, 2017

Activity: 1) Visit to Dairy Farming Promotion Organization of Thailand 160 Mittraphaap Rd, Mittraphaap, Muaklek, Saraburi

2) Visit to Dairy Farm near DPO

Purpose:

1) To learn about overview and activities of organization, how they work with small scale farmers
2) To learn how the cooperatives works together (milk collection, fodder cultivation, cooperative work support system, if any), visiting milk chiller

Facilitator: Dr. Ghulam Muhammand Jiskani

Minutes taker: Dr. Ali Akthar Shahani

Mr. Thamoon Thongprapai Chief of Farm Division Department of Dairy Research and Development briefs about the activities of DPO in Saraburi province.

[Background]

The Dairy Farming Promotion Organization of Thailand (D.P.O.) was established by the government as a state enterprise under the Ministry of Agricultural and Cooperatives in 1971. One of the D.P.O.'s first activities was to take over the Thai Danish Dairy Farm (TDDF) and Training Centre at Muak Lek, Saraburi Province.

The TDDF was a technical cooperation project between the Thai and Danish Governments. The project for the TDDF was initiated during His Majesty the King Bhumipol Adulyadej of Thailand's state visit to Denmark in 1960.

The King was interested in dairy farming and the Danish Agricultural Organization presented this project. On 16th January 1962, the farm was inaugurated by Their Majesties the late King Frederik IX of Denmark and King Bhumibol Adulyadej of Thailand. During the first eight years of the project, it was managed by Danish personnel in close cooperation with the Thai staffs. In the two years prior to handing, the Thai staffs assumed administrative and financial control.

[Dairy Farming Promotion Activity Section]

- To promote the raising of dairy cattle or other dairy animals,
- To train and educate people in dairy husbandry, dairy production, dairy processing and dairy products.
- To advise dairy farmers in dairy management, artificial insemination, feeding and disease control.
- To buy, sell, exchange or donate dairy animals and dairy products,
- To operate other activities connected with dairying and its organization and
- To develop the processing of milk products.

To achieve the above-mentioned objectives, the D.P.O. is also empowered by the Royal Decree,

- To buy and sell, exchange or donate dairy animals and dairy products including dairy feed, embryo and semen, and dairy equipment.
- To develop and operate the processing of milk products,
- To hold proprietorship of land and other assets, to own property, to construct, buy and sell, to assign and be assigned land, assets or rights within and outside the Kingdom,
- To join and work in association with other people or to establish a partnership or a limited company as well as to hold shares of a limited company, a partnership or juristic person, for the benefits of D.P.O.'s business,
- To co-operate and promote technologies, marketing and other assistances to the dairy cooperatives, farmer group and dairy farmers,
- To create and undertake business relation to dairy plants, dairy or meat products, refrigerated trucks, dairy and meat shops,
- To act as branch office, representative, agent trades, commission agent or broker for private enterprises or juristic person within and outside the Kingdom for the benefits of D.P.O.'s business,
- To borrow and lend money, guaranteed by persons or property.

Thai-Danish dairy farm (December 31, 2017).

Item	Demonstration dairy farm	Organic dairy farm	Total
Milking cows	79	23	101
Dairy cows	92	14	106
Pregnant heifers	46	1	47
Non-pregnant heifers	26	0	26
Young calves	37	0	37
New born	24	0	24
Bulls	40	0	40
Total	394	38	432

D.P.O. Complete Circle Operation - "Self Support Budgeting Organization"

- Training course and Exhibition: to promote and give basic learning and technology transfer
- Extension & Services: to support and encourage farmers to produce good quality milk and improve efficiency
- Farming in put Supply: Cows, Feed, Chemical, Drugs, etc
- Milk Collection Center: to ensure primary milk market
- Dairy Processing: 5 dairy plants in 5 regions of Thailand
- Dairy Marketing: dairy products in commercial and school milk market

Dairy Farming Promotion Projects

- New Career Promotion ensure main incomes
- Substitute unsuccessful Agriculture Production: cassava, pine apple, rice
- Restructuring Agricultural Production: Agricultural Land Reform
- Support new colony for public welfare
- Support King's Projects
- Support Dairy Cooperatives Promotion
- Training & Exhibitions
- Feed Supply
- Veterinary and Artificial Insemination service
- Farming and Dairy Technology Demonstration
- Buy& Sell Dairy Cattle: Dairy cow bank, Dairy Cow Insurance

- Herd Health Assurance
- Buy Raw Milk in guarantee price
- Promote efficiency and improve milk quality production
- Dairy Herd Information Service (DHIS)
- Milk Collection Center Assessment

D.P.O. as the Secretariat of the National Dairy Committee

- Raw Milk monitoring: Commercial and School Supplier
- School milk Marketing Management
- Stimulate Milk Drinking Campaign:
- World Milk Day
- Improve Milk quality and Efficiency Production

The activities of DPO in Saraburi province.

- Develop Dairy Territory
- Established laboratory for testing milk quality
- Assess genetic inheritance
- Develop TMR under the guidance of animal nutritionist advisor
- Produce milk product according to certified international standard
- Support farmers to produce 100% pure organic milk
- Monitoring school milk program – started from 1992
- Training of livestock farmers in various subjects at DPO training centers
- Promote Dairy Farm Agriculture Tourism

[DPO Genetic Improvement Project (to produce tropical adopted dairy cattle)]

Thai Dairy Cattle Population

1. The population composed of several based breeds

2. Most of animals (> 90 %) are crossbred

3. All of these animals are raised under Thai-tropical conditions

Dr. Muhammad Mubarak Jatoi Livestock Genetic Specialist ask the question about procedure of pedigree registration and selection of progeny tested bull

Dr. Thammanoon Thongprapai replied:

Well Selection:

- Elite Dam and 3-5 good bulls are selected based on Elite parent bull and parent dam based on Herd book and breeding carried between these through AI
- Female calves registered to be bull dam and 30 Bull calves Raise at bull station
- 10 Bulls passed after primary test and 20 bulls are culled
- Produce 30,000frozen semen, 28,000 doses Stored in Semen bank and 2,000 doses used for Progeny test.
- Evaluation carried at least 30 daughters and 3 Best Bulls are selected
- DPO publish every year Sire & Dam Summary based on Genomic Evaluation

Process to Produce Sire Summary

Farmer → Department of Dairy Research and Development ⟷ University of Florida

After receiving result Department of Dairy Research and Development publish sire summary and semen of proven sire use for AI.

DPO Sire & Dam Summary

Consist of:

1) Detail of data which use for EBV analysis, basic statistic and genetic parameters
2) Methods of data analysis result of populations evaluation and the conclusion
3) EBV and accuracy for the traits of milk yield, fat yield , lactation length and age at first calving of each sire or dam
4) Ranking of sire and dam

After presentation of Dr. Thammanoon Thongprapai team visited Farmer Training Center where training on Artificial Insemination was going on.

X. Mittrapharb Dairy Cooperative

May 18, 2017

Activity: Visit of Dairy Milk Cooperative in Saraburi Province

Purpose: 1) Physically visit of dairy milk cooperative to observe the mechanism of milk collection

2) Collection and processing of milk, testing of samples, mode of payment and facilities providing to the members.

Facilitator: Dr. Iqtidar Ali Memon

Minute's taker: Dr. Ghulam Muhammad Jiskani

Visited Mittraphab Milk Cooperative Milk collection center in Saraburi Province having 214 registered members, at present 188 members are supplying the milk to this cooperative with 32 tons daily supply.

This cooperative is only getting the milk from their registered farmers with weekly payment bases and price is considered as a grade wise i.e., grade 1=18.3 Bhatt, grade 2 =18.1 Bhatt, grade 3 17.5 Bhatt. grade 4 =16.5 Bhatt and total solids 12.13 Bhatt.

Visited inside the milk collection, processing section and observed the sample collection procedure of milk at milk cooperative collection center from members who are supplying the milk Immediately after sample collection from each supplier milk was mixed into big milk tank and proceeds for further processing.

At this milk collection center, certain milk tests are performed which are as follows;

1. Bacterial count test
2. Mastitis test
3. Hygienic Test
4. Alcohol Test
5. Specific Gravity test
6. Milk composition Test

At present 214 members of this milk cooperative supplying the TMR ration by this dairy cooperative, small scale farmers are taking the TMR themselves with the rate of 4.6 Bhatt/ kg with CP 18% where as large scale and commercial dairy farmers pay 127 Bhatt/25 kg bag and total supply 10 tons per day with transport charges.

Nutrition expert from faculty of Agriculture science also provides the guidance for TMR preparation procedure and its quality maintenance.

In emergency health coverage of livestock animals of the member farmers of dairy cooperative

Department of Livestock promotion provides the services on cost bases and also carries out extension activities for the farmers for improvement of dairy farming and production.

At present this center has 10 tons TMR production capacity per day and they have recently improved the production capacity of TMR and established a new unit for more capacity and production up to 30 tons per day.

Production cost per bag is 110 Bhatt and cooperative is getting 5 Bhatt profit/ kg and this is good quality TMR as well as good support to the dairy farmers of the cooperative group.

The shelf life of TMR ration is maximum 2 weeks in normal environment and packaging is into 2 layers of plastic sheets. At present tractor is efficiently and economically used for making TMR and very soon they will use the Italian machine to expand TMR production unit.

Over all visit of cooperative was very nice to understand the cooperative mechanism, milk supply chain, mode of payment and facilities providing to the farmer members.

At last Dr. Iqtidar Ali Memon presents the Ajarak gift to the in charge of cooperative that were facilitating and briefed about their organization and vote of thanks asked by Dr. Jiskani.

XI. Animal Nutrition and Development Center

May 19, 2017

Activity: Visit of Animal Nutrition and Development Centre
Purpose: To learn about overview and activities of organization.

Facilitator: Dr. Ali Akhtar Shahani.
Minute's Taker: Dr. Naeem Siddique Ansari.

Visiting team arrived at Feed Nutrition center at 09:00AM.

Mr. Sarayut welcome the team.

First presentation is on Orientation of research on Animal Nutrition,

This Feed Nutrition center established on 1961 at Muaklek District Saraburi. The area of center is 368 hectors. The Saraburi divided into three region and every region have regional office. The livestock population in three region is Beef cattle 1204880, Dairy Cattle 88695, Buffalo 358442, Goat 14934 and sheep 973. The rain fall/year is 1100mm. The Oct-Nov is rainy season and Jan-Feb is drought season. The purpose of this institute is a) Research in animal nutrition, b) Development of technology for pasture production and pasture distribution, c) extension services, d) feed analysis services. The activities of this institute is a) Pasture research b) Pasture plant diversity conservation c) Collection field of introduced species d) Collection field of domestic species e) pasture seed gene bank f) Pasture plant breeding g) Breeder seed production. This institute is also support Royal project on livestock, support the farmer during natural disaster, flood, drought etc. This institute developed suitable crop cultivation techniques, introduce effective irrigation system, promotion of commercial silage by farmers.

Second presentation on Cultivation and Utilization of new Hybrid Napier Grass in Thailand. In this center new hybrid Napier grass produce, the feature of this grass is high CP i-e 16-18%, suitable for silage making, high palatability, no dormancy period, rapid growth, high production i-e 480 tones/ha/year in six cut, 8 year life, good grow through farm yard manure, no side effect of this grass.

After presentation on Orientation of research on Animal Nutrition and Hybrid Napier Grass given by Mr. Sarayut & Mrs. Rattikan because actual person is on leave/outside the country started

Question and Answer session.

Q/A	By	Question/Answer
Napier Grass		
Q1	Dr. Safdar	Why you do not use napier grass for grazing?
Ans		Because we cannot keep the same height of grass if we allow the animals to graze.
Comments	Dr. Zulfiqar	Animals are not grazed to avoid wastage of grass.
Q2	Dr. Jiskani	Did you note any adverse effect or poison of napier grass?
Ans		Never occurred.
Silage		
Q1	Dr. Jatoi	You are making 30kg bag of silage. Big amount reduces the cost of labor?
Ans		Every farmer has own policy depending upon numbers of animals.
Q2	Dr. Arif	What kind of program do you face when you make silage?
Ans		High water contained grasses, one company solve this program and make machine to reduce water content but this machine is use by large scale farmers.
Q3	Dr. Arif	Without silage making machine, is it possible to make silage?
Ans		In Thailand, there is a project on silage making for big farmers, but small-scale farmers make a group ad can enjoy this project.
Extension		
Q1	Dr. Rukhsana	About nutrition of animals, what extension services you provide?
Ans		We introduce low cost TMR. Approximately THB 4 / kg. (depending upon materials.)
Q2	Dr. Rukhsana	If the farmers want to make TMR, what facilities you provide?
Ans		We develop model farms. In that farm, we demonstrate to farmers. We cannot provide facilities to all farmers.
Q3	Dr. Rukhsana	How many farmers adopted this technology of TMR?
Ans		Not sure, the TMR project is on-going for demonstration.
Q4	Dr. Arif	What kind of disease are common?
Ans		Parasites, anaplazmosis and babisia
Irrigation		

Q1	Dr. Arif	You have any irrigation system or you depend upon rain? During shortage of water how you manage?
Ans		Some area has irrigation system and that area napier grass is suitable for sowing and where irrigation system is not available, the production is low. When rain comes, napier grass grows.
Q2	Dr. Mubarak	In which month you face drought/ heavy rain?
Ans		Rainy season is Oct. and Nov. Drought season is Jan. and Feb.
Other		
Q1	Dr. Arif	Mostly farmers have own land or not?
Ans		Mostly farmer have own land.

After completion of Question and Answer session, Dr. Jiskani presented Sindhi Topi to Mr. Sarayut, Dr. Safdar and Dr. Iqtadar presented Ajrak to Mr. Sarayut.

[Visit of Laboratory]

First we visited the laboratory for feed analyses. Demonstrator show us analyze the wastage of Rice polish. The sample put in the machine for one minutes and computer shows result.

Ash 1.47, Protein 8.16, Fat 2.04, Moisture 12.8, Fiber 0.3, NFF Raw 87.97.

Second laboratory visited for Pasture seed. In this laboratory they check seed quality, seed inspection.

Third laboratory visited for Detergent analysis laboratory.

Fourth Laboratory visited DNA technology Laboratory, this lab is established 3 years ago. The budget for this lab is 4 million Baht/year. There is so many DNA Laboratories in Thailand.

[Visit of experimental station]

we visited Thai Native Cattle (Male) station.

In this farm there is experiment on Thai Native Cattle with TMR (Make by Corn Silage).

- They are feeding Rock salt.
- They are feeding Silage 3-4 months.
- Average weight gain 490 g/day to 680 g/day
- Intake of feed is 9 to 10 kg/day, normally 12 to 15 kg/day
- Less intake due to change in feed.
  There is another experiment is ongoing Japanese Wagyu to Thai Native.
- The daily weight gain is 970 g/day to 1.03kg /day.

[Visit of Factory]

we visited the factory where silage is making.

- Corn have no much water due they have no need to use machine.
- The silage bags are kept in the farm for 2 months.
- The pH of corn is decreases 4.2, the original pH is 7.
- The best time for silage making of corn is 90days after sowing maize.
- 50% milk line in corn seed is best time for making silage.

Finding:

- Silage making in large and small quantity.
- Sowing high yield neipher grass.
- Cross breed Native with other country breed.
- Reduce the moisture through machine.

Recommendation:

- Small quantity of silage making easily replicate and useful.
- Sowing Neipher grass increase the production of our farmer.

XII. Small Scale Farmer

May 19, 2017

Activity: Visit of Small Scale farmer.

Purpose: 1) To learn how the small scale farmer established relationship with Co-operatives.

2) To learn how small scale farmer rearing animals (Farm Management, Feeding Management, Fodder Management, Calf rearing method, Breeding method, bi product production, marketing).

Facilitator: Dr. Ali Akhtar Shahani.

Minute's Taker: Dr. Naeem Siddique Ansari.

Visiting team arrived at small scale farmer at 15:00PM.

Owner of small scale farmer Mr. Winai Kumpiranon welcome the team.

[History of the farm]

Mr. Winai Kumpiranon briefed to the team that before starting farm I was doing in DLD district office as a Livestock Technician for 7 years. He left the job due to not good carrier, low salary, no promotion. His routine duties during job is providing A-I services to Livestock owners. After leaving his job, he is providing A-I services to other farmers on cost basis i.e. 200 Baht/Straw and also providing treatment to their register members animals on cost basis.

He started this business before 30 years ago with 4 heads, and at this time increased to 60 heads of cattle. Among 60 heads, 20 heads in milking. There is no worker working in this farm. All family members involved in the work of farms. The family members involved in the farm are wife, two sons, one daughter in law, one grandson. He has own land i.e.10 acre or 25 Thai unit. The Student from Agriculture university join this farm work in this farm for learning. At that time only one student working in this farm, he is paid 100 baht/day for his allowance.

[Farm Management]

Cattle rearing system is semi-intensive. Farm buildings constructed are looking good and ventilated. The management is not good. No tagging, no any record related to the farm, no health record, No economic analysis of the farm. When number of Asset increases he understand that I am going in profit. He will not pay any salary to their family member they are involved in farm

management.

[Fodder development]

He possesses 25 Thai unit of land for this farm where he cultivates Neipher grass.

[Feeding Management]

He is making own TMR and sell to their registered members at the rate of 4 baht/kg.

[Calf rearing method]

Team observed different method of calves rearing at this farm as compared to Sindh province. After birth calf received colostrum through bucket and separate from mother. The milk is also feeding through bucket. Up to 10 days he feeds rejected milk, 4kg/day and then started TMR14% with milk 2kg/day/head (1Kg milk + 1kg water) or feed skim milk powder. At the age of 4-5 month he stops feeding milk and starts water with TMR 14%. The weight gain of calves for first month is 18-20kg/months and from second months 10kg/month is weight gain. The mortality of calf is zero at this farm. The skim milk cause diarrhea.

[Marketing]

He produced 270kg milk/day and he also operating milk collecting center. In this center 30 farmers are registered and their total number of animals is 600 milking heads. He supplied 6 tone milk/day to co-operative. He purchased milk from farmer at the rate of 19 baht/kg and supplied to the co-operative at the rate of 19.5 baht/kg. The price of milk is depending upon their quality. He established fat, protein, somatic cell count checking at their center.

Finding

The farm management was not good particularly calves pen dirty, wet and weight of calves is low. They are providing rejected milk and not known about lactation period causes diarrhea in calves. The farmer has multiple tasks due to not manage the farm properly.

Recommendation:

Calf rearing technique can be replicate and reduce the cost.

Dr Arif presented Ajrak to Mr Winai Kumpiranon and Dr Ali Akhtar Shahani present vote of thanks.

XIII. Debriefing / Wrap up Session

May 20, 2017

Activity: Debriefing/ Wrap up Session

Purpose: 1) To review outcome of the 3rd country training

2) To share the observation by each counterpart

3) To know (what we have learnt and What we will apply in future)

4) To prepare study report

Facilitator: Dr. Muhammad Arif Khan

Minute's taker: Dr. Muhammad Mubarak Jatoi

Debriefing /Wrap up Session was conducted at the Pisarro room (4th floor) Banquet function Novotel Bangkok by time 15: 30 pm.

Recitation of Holy Quran by Dr Muhammad Arif Khan

Each counterpart shared their (Observations, Findings, Conclusion, and Recommendation) and learning's regarding whole exposure Visit in nice way and creative way. Detailed brief of each counterpart is as under.

Dr Muhammad Mubarak Jatoi, Counterpart of Livestock Genetic Improvement

I really appreciated the efforts of Dr. Tominaga san and his team and renounced scientist Dr. Rangsun san to arrange the exposure visit to know the remarkable development of livestock sector in Thailand

Dr. Rangsun san and Dr. Thatawat gave presentation on the general history about the Thailand, its culture, different kinds of food and development of livestock sector in a creative and comprehensive way. Director General and Deputy Director General of the Department of Livestock Development, Ministry of Agriculture and Cooperatives Thailand, shared the delegation about the organogram, objectives and functions, responsibilities and activities and as well as the cooperation and coordination of (DLD) with other institutions which are involved and playing vital role for the development of livestock sector. Further it was shared that DLD has started pedigree registration system and more than 60% animals are registered and tagged.

Visited the Murrah Farm in Chachoengsao Province. Really it was very remarkable step of Madam Runchuan Hengtrakulsin to establish the Buffalo Farm in Thailand and reared the calves (separate from mother). Breeding Method for buffalo was by natural. Bull is used at the ratio of 1:20 females. Oxytocin was not used at farm. Milking machine was used at the farm. On query she shared that, I am not getting proper technical guidance regarding animal health coverage, farm management, feeding and fodder pattern, breed improvement plan from any organization and institution which are involved in livestock sector. It was observed that overall health conditions of animals were not according to health standard. At presently she was not getting required production from their animals according to their production potential.

Visited the small scale farmers (Thai Milk Cooperatives) in Lam Phaya Klang District along with Dairy Herd Health unit. Objectives and Goals of DHHU were to reduce the production cost, to increase quality and quantity of raw milk, to establish the network, Traceability**,** Healthy cows**,** Increase milk yield 3% per year, Decrease calving interval 5 days per year, Better quality and composition 5% per year, Increase profit of farmers, different members of team asked the question and got satisfactory response from the chairman of cooperatives, then district officer of Department of Livestock Development (DLD). Ministry of Agriculture and cooperatives also gave a detail presentation about the Saraburi Provincial Livestock office its work and role for the improvement of livestock sector development. Visited the Dairy Farming promoting Organization (DPO) Muak Lek Saraburi Province. DPO in charge shared to team that Dairy Farming Promotion Organization of Thailand **(**D**.**P**.**O**.)** was established by the government as a state enterprise under the Ministry of Agricultural and Cooperatives in **1971.** One of the D**.**P**.**O**.**'s first activities was to take over the Thai Danish Dairy Farm **(**TDDF**)** and Training center, DPO has good working relationship with DLD and cooperatives and it provides different kind services at door steps of registered farmers. DPO is playing very active and informative role to provide extension services to registered farmer and cooperatives. The Genetic Improvement program of cattle in Thailand was not applicable in Sindh province, because they have mixed five breed bloods to produce sub-tropical breed for Thailand, so we have to develop owns breed improvement model for buffalo.

Visited the Nutrition development and research center run by DLD was very nice and it showed that DLD was trying to provide good quality fodder and seed of fodder for farmers to get more production from their animals.

Visited one small and one medium scales farmer, it was observed that both farmers were not keeping genetic record even they don't know about breeds and most of the animals found un-tagged, whenever they face the health issue with their animals they call private vets on cost basis.

[Findings]

1) Heifer rearing Model: applicable in Sindh.
2) Heifer rearing center running under the technical guidance of cooperatives on the following terms and conditions:
    ① Received female calves at the age minimum 2 months from the member farmers at 3,000 Bhats.
    ② Female heifers kept until reached reproductive status of six months pregnancy.
    ③ Pregnant heifers are available for sale 50,000 Bhat for member farmers or other private farmers.
2) Genetic improvement model of cattle was applicable in Sindh on non-descriptive cattle's, and not in Kundhi buffalo, so we have to develop owns genetic improvement model for our indigenous breed.
3) Cooperative of small scale farmer is not applicable but in Breeder farmer, we can replicate it and make cooperative of breeder farmers,
4) Silage model can be applied in Sindh
5) Training and extension center services of Thailand may be applicable in Sindh

Dr. Muhammad Arif, Counterpart of Fodder Development and production

He said that I have learnt many new things regarding feed and fodder development and other things in this exposure visit. Further he said Thailand Milk cooperatives are very nice system for the farmers, because cooperatives provide facilities to farmers at door steps. Not use of oxytoxcin at Murah Buffalo Farm and calf rearing system was very good. DLD has developed very nice nutrition development and research center where they analysis the grass and seed. The presentation given on Hybrid Napir grass by the representative of DLD was very good and I observed well established TMR system. Cooperative system was very good for the farmers.

I really impressed the Thai Government in respect to 40% school milking program.

Dr. Zulifqar Ali Pathan, Counterpart of Animal Health

He said that 1st day orientation by Dr. Rangsun san and Dr. Thatawat about Thai culture, food and visiting places and general overview of livestock sector was very informative and comprehensive. He appreciated the role and responsibilities of DLD in respect to provide health cover and interlinked the another Institutions who are also playing vital role in the development of livestock sector, He appreciated the overall structure and mechanism of Meat market, He shared that during the visit of Murrah Buffalo Farm , it was observed that the health status of all animals was not good, which showed that owner of farm was not technically aware and on query, she replied that she is not getting any sort of technical guidance and support from any organization. Furthermore, he appreciated the role of Dairy Farming promoting Organization cooperative in the development of livestock sector. He shared about the visit of small scale farmer, it was observed that overall management and health status of his animals was not satisfactory and no any record mechanism was found at the farm, though all family members are involved in the routine work of farm. Though owner of farm was technical person but unfortunately his veterinary tool and medicine were kept in un-hygienic condition.

Dr. Ghulam Muhammad Jiskani, Counterpart of Livestock Farm Management

He appreciated the efforts of Japanese experts as well as Dr. Rangsun for arranging study tour for counterparts to visit livestock sector of Thailand. Visited Department of livestock (DLD) and briefed about livestock sector development and services provided to the farmers through DLD and cooperatives. They briefed that they have good tagging and traceability system in their country.

He shared about the visit of dairy promotion organization which have well established mechanism for pedigree registration and selection of proven bull, good extension training services to the Thai dairy farmers.

Visited first established dairy farm initiative by their Royal King 1962 with the support of Denmark government and observed rearing of calves that was very nice with good management practices. We can replicate this kind of the calf rearing pattern on trial bases in our pilot districts. During the visit of second largest cooperative, it is observed that good quality checking mechanism of milk at the laboratory, further he said that at their farm they were rearing two months age calves taken from registered members at the rate of 3000 Bhat and rearing at their

farm up to six months pregnancy period and then sell to the same farmers at the rate of 50000 Bhat. That was very nice, impressive and beneficial for the farmers.

Visited feed Nutrition center observed good infra structure with functioning lab: for analysis of feed samples as well as seed grading for farmers and making TMR and Silage at reasonable prices.

Visited small scale dairy farmer owned 20 milking cattle and he was also working as a middleman and getting milk from other 30 members of farmers and selling 6 tone milk per day and providing A I and technical services on cost bases.

Visited Murrah buffalo farm owned by lady, she has taken a very bold step to establish buffalo farm in Thailand and practically observed the milking buffaloes without suckling of calves and stimulation.

Dr. Naeem Siddique Ansari, Counterpart of Livestock Asset

Visited DLD office on 15 May 2017, during briefing he informed us that the price of milk is decided by National dairy board but the retail price is decided by factory, i.e. 19 Bhat farmer price and 40 Bhat factory price. Food and drug (FDA) association is responsible for control of hygienic milk but in our country, this maybe control by health department. They developed free zone of FMD, that is good. Government providing loan to small scale farmer on low interest rate and get payment/return after 3 years that is also good practice and our government will take imitative about loan. School milk project is good for the health of student as well as boost up this industry. TMR with different CP % with low rate is good thing and applicable in our country.

Cooperative purchased calves at the age of 2 months at the rate of 3000Bhat are not good and not fulfil the requirement of expenditure. The risk factor for mortality is first months.

Silage making 30 kg is replicable in our country, before this first we introduce high yield fodder.

Cooperative system is replicable after changing the definition of small scale farmer.

Dr. Rukhsana Vighio, Counterpart of Extension and Training

She shared that current situation of Thailand in respect of livestock sector development was very nice and good. The dairy promoting organization (DPO) of Thailand and Denmark government have agreement as a state enterprise by the ministry of Agriculture and cooperative in 1971. One of the DPO's first activities was to take over the Thai Danish farm and training center at Muak lek Suraburi province.

Objectives of DPO extension activities

1) To promote the raising of the dairy cattle and other dairy animals.
2) To train and educate people about dairy husbandry, dairy production, dairy processing and dairy product.
3) To advise dairy farmers in dairy management, A I and feeding and disease control.
4) Training course, exhibition and workshop for livestock farmers based to promote and give basic learning and technology transfer.
5) Extension services to support and encourage farmers to produce good quality milk and improve efficiency.

Training and Exhibition

Trainings were focused on following main subject.

Artificial Insemination, feed and feeding management, Breeding management, Training on milk machine operation, dairy animal management, training cost for cooperatives and DLD employs were 4000Bhat/head. Training cost of outsiders were 5,000Bhat/head. Training announced by extension officers who was in charge extension and training center.

DLD, Cooperative and private sector sent the farmers for training, in each training 20 participant selected 200 students got the training in current year.

Dr. Ali Akhtar Shahani, Counterpart of Livestock Reproduction

He appreciated Dr Rangsun as well as Dr. Thatawat. They shared us basic knowledge regarding Thailand culture, food, visiting places and general over view of livestock sector in Thailand in very nice way.

Dairy Promoting Organization has good cooperation with DLD to carry on the activities in organized way for the development of livestock. We visited the Murrah Buffalo Farm, He said that though she was facing many problems in all respects but it was inspiring to establish the Murrah Buffalo Farm in Thailand. Further he shared that cooperatives were organized and performed their work properly and providing all kinds of services to farmers in good way. He said that we can develop that model in District Tando Allahyar.

He said that the Nutrition development and research center was very good and inspiring.

Calf rearing separately at Murrah Buffalo Farm was good practice in buffalo.

Breed Improvement program of cattle in Thailand is not applicable in Sindh Province, so we have to develop owns model for Buffalo Breed Improvement.

Dr. Safdar Ali Fazlani, CP Feeding Management.

He appreciated that Japanese Team and Dr. Rangsun san to arrange such type exposure visit of Thailand.

He shared that visited small scale farmers are according to Thai criteria, those farmers who reared more than 5-20 animals are called small scale farmers.

All Institutions were very cooperative with each other with regards to development of livestock sector.

Further he said that every member of cooperative was using TMR, and TMR techniques may be implementing in Sindh. Nutritional laboratory was very nice and well established and do function properly. Thai cooperative had a good mechanism of Milk processing and Quality checking system.

Dr. Iqtadar Memon, Counterpart of Marketing

He shared that in Thailand 100% farmers were market oriented and sale their milk to cooperatives. Whole nation is using pasteurized milk and UHT. There is no whole sale market, and Milk is sold out to Nestle and another organizations. The Farmers avoided the any sort of adulteration in milk. All cooperatives had a good quality checking system. Cooperatives provide all kind of services to farmers at door steps. King was taking interest in the development of livestock sector.

Thai farmers were easily accepting the appropriate technology to get more production from their animals. In Saraburi province usually heavy rain fall, so mostly all kinds of livestock are found in this area. Price of milk and meat depends on the quality. Further he said that small scale farmers have low or no education and almost small scale farmers are registered in any cooperative and cool chain have main problems.

Outcome of Group discussion in the wrap up session on 20 May 2017

= What you are going to apply in Sindh from what you have learnt in Thailand? =

[Group A] – Dr. Shahani, Dr. Jiskani, Dr. Jatoi, Dr. Zulfiqar

1) Calf Rearing: Different district model development in pilot areas
2) Development and Strengthening of RTI for extension activities for farmers: Development, strengthening, financial aid or funds by Government or Donor Agencies to support educating small scale / medium / large scale farmers regarding all fields / areas.
3) Development of Cooperatives of Livestock Farmers: Making farmers groups, registration of farmers at union council level on trial basis for milk collection and support, provided to all farmers for veterinary aid services.
4) Silage / TMR making: Identify potential areas and carry out the activities on trial basis for making silage / TMR making

[Group B] – Dr. Safdar, Dr. Iqtadar, Dr. Naeem, Dr. Rukhsana, Dr. Arif

1) Farmer's Training on all appropriate technologies
2) Awareness Campaign (Pamphlet, Workshop at District Level)
3) Strengthening of RTI
4) Cultivation of multi-cut grasses
5) Development of Laboratory for Feed and Fodder Analysis
6) Silage Making
7) Introduction of Milk Quality Control Laboratory
8) Introduction of Small Cooperative on Trial basis
9) Introduction of Calves Rearing at Rural Level
10) Availability of Formula Feed at Small Scale Farm level
11) Introduction of cold chain technologies at village level
12) Development of human resources

Note: The details (how, by whom, short-term plan, mid-term plan, longer terms plan will be discussed more in July.

6. Findings

- Findings of each field stated by the each counterparts -

Findings (Farm Management) Dr. Ghulam Muhammad Jiskani

Visit for counterparts organized by JICA under the "Project sustainable Livestock Development for Rural Sindh" held from 13th May up to 22nd May 2017 in Thailand as a exposure visit to know and understand livestock sector of Thailand. The livestock sector of Thailand has a very short history and the initiatives were taken by King of Thailand Ramma 9 for promotion and development of livestock institutions, providing financial and technical support to livestock farmers for rearing, management, feeding and increasing the number of livestock heads in the country.

Visited Murrah Farm owned by lady was a commercial dairy farm having 380 heads and observed the management practices of farm i.e. feeding, bathing, milking practices by machine milling that was very nice observation but the production at the farm is very low.

Visit of small scale dairy farm of Mr. Winai in Saraburi province was a commercial dairy farm having own land and also working as middle man collecting milk from 30 member farmers and supplying to big company 6 tons per day as well as providing A.I and treatment services to their member farmers on cost basis because he was A.I technician in Thailand livestock Department. Whereas small scale farmer of Sindh province is totally different from Thai farmers because he is keeping small number of animals having no land working as a tenant farmer, non-farmer but in few cases having small portion of own land where as Thai farmers almost having own land.

Visit of medium scale dairy farm of Mr. Sultan Shah in Saraburi province was the commercial dairy farmer having own land. His management was good, Animals were healthy. He was treating his own animals by himself but in case of serious animal health issues gets services from private vets. He is selling milk to processor and also run the own slaughter house five days in a week.

Visit of Thai dairy cooperatives provides many facilities on payment to member dairy farmers for example, extension services, A.I services, Treatment, TMR, Trainings, Loans for purchase of animals, equipment's and emergency loans. Member dairy farmers supply all milk to the dairy cooperatives both times.

Observed that visited farmers of Thailand are not keeping the farm management record at their farms but through JICA project we developed the farm management data collection of first group pilot farms to know the current situation and conduct the economic analysis so that to start the

technical guidance on proper Farm management and sound dairy business management small scale rural farmers.

CONCLUSION:

As for my understanding and capacity building Thailand visit was very much fruitful in respect of understanding about livestock sector of Thailand, institutional development, development of dairy cooperatives, support provided by livestock farmers through Department of livestock development and department of livestock promotion in different aspects of feeding management, farm management and awareness for TMR feeding, silage making and control of different livestock diseases at their farms.

Also it was good opportunity to me to observe the farm management practices of Thai small scale as well as medium scale farmers and to observe the machine milking practice applied at Murrah farm.

Findings (Marketing) Dr. Iqtadar Ali Memon

Findings of livestock marketing in Thailand during Thailand exposure visit in May 2017 by counterpart of marketing are mentioned as under;

- In Thailand no body is using fresh raw milk even the milk producer / farmer.
- Dairy farmers sell 100 % fresh raw milk to the processors.
- Whole nation is using UHT / Pasteurized milk.
- The consumers prefer fresh milk in shape of pasteurized milk.
- There is no whole sale fresh raw milk market in the Thailand.
- Milk is sold to milk collection centers of dairy cooperatives and other processors.
- The dairy cooperatives and other processors purchase milk from registered members.
- The average milk price at milk collection center is 17.5 to 18.5 TBH per liter depending on the quality of milk.
- The price of milk in super market is 38 TBH / Liter for UHT and 42 TBH / liter for pasteurized milk
- The average cost of production is 10-11 TBH per liter.
- The supply of milk at milk collection center is two times (Morning and Evening).
- The mode of payment is on weekly basis through bank.
- All Dairy cooperatives, processing companies and milk collection centers have quality check system and perform following tests, Bacterial count test, Mastitis test, Hygienic Test, Alcohol Test, Specific Gravity test, Milk composition Test, freezing point and COB (Physical, Chemical and Microbial tests)
- The average milk production per head per day is 13 liters
- No any dairy farmer is cheating by doing adulteration or selling low quality milk, contaminated with mastitis and antibiotic residues. (If farmer will do so there will be fine by law).
- Dairy cooperatives give many facilities to member dairy farmers like loans (purchase of animals, farm equipment's, milking machines and emergency loans on low markup rates), silage, TMR, extension services, vaccination, treatment and A.I services.

- Thai dairy farmers are highly motivated producing good quality hygienic milk and selling raw milk to dairy cooperatives and processors.
- Dairy promotion organization of Thailand has established organic dairy farm and selling organic milk.
- The demand of organic milk increases and the price is 40 TBH per 200 ml pack.
- Initially government supported to dairy cooperatives and dairy promotion organization under the ministry of cooperatives for the development of infrastructure, now they are working as self-funding organizations.
- This is because of kings (Rama-9) special interest in dairy farming, so in the very short time Thailand developed the livestock sector in the scientific and well managed manner.
- Mostly the small scale farmers of Thailand are educated easily understand the appropriate technologies and apply at the farm,
- The small scale farmers have minimum 20 milking heads and all small scale farmers have their own land.
- There is no any NGO working in livestock sector of Thailand.
- There are 108 registered dairy cooperatives in Thailand.
- Out of 108 dairy cooperative 91/97 are active dairy cooperatives.
- The Saraburi province has fertile land having heavy rain falls and also big pastures mostly dairy farming is in this province.
- Animals are sold and purchased by auctions through dairy cooperatives.
- Meat marketing is done through super markets and local meat markets we visited.
- Meat is sold depending on the part of body like rib eye, tenderloin, mince, Lion back, Strip lion, bone less, with bone, and dry meat.
- The price is also depends on the quality and body part.
- Fresh dairy cattle 600 TBH / Kg.
- Fresh Beef cattle 450 TBH / Kg.
- Dry meat 400 TBH / Kg.
- Fattening cow Brahman + Shalory (Crossbred) 1000-1500 TBH / Kg.
- Thai chicken 135TBH / Kg.
- Thai layer egg 6TBH / egg.

Findings (Feeding Management) Dr. Safdar Ali Fazlani

Observation:

It is a fact that Livestock sector in Thailand has been remarkably developed with in short span of time due to well-planned policies and positive role of Thai Government as well as creative and productive cooperation and coordination of all involved stakeholders of this sector.

Finding:

In Thailand exposure visit My findings regarding Animal Nutrition center. The history of this center was very short but they developed scientifically. In 1961 Organization was established at Muaklek District, Saraburi and In 2003 Renamed as "Nakhon Ratchasima Animal Nutrition Research and Development Center with support of Department of Livestock Development & other stakeholders they developed Feed Analysis laboratory like Feed and Forage lab, Biotechnology lab, Tissue culture lab: etc.

This center also has different sections like:

- Pasture Research section
- Research Collaboration with other countries (JIRCAS) etc.
- Pasture Production Section (rootstock & seedling production)
- Pasture Field, Silage & Hay production
- Pangola hay making
- Distribution hay to farmers in flooding area
- Animal Nutrition technology extension services section (development of low cost TMR)
- Development of the sustainable forage crop cultivation techniques
- Promotion of commercial silage by farmers
- Feed Analysis Laboratory & Services
  - Pasture plants
  - Feedstuff
  - Agriculture by-products
  - Agro-industrial by-products

- Proximate Analysis
  - Moisture
  - Crude protein
  - Crude fiber
  - Fat
  - Nitrogen free extract(NFE)
  - Ash
- Detergent Analysis
  - Acid Detergent Fiber(ADF)
  - Neutral Detergent Fiber(NDF)
  - Acid detergent lignin(ADL)

This Animal Nutrition Center also developed A new Hybrid Napier Grass in Thailand for fodder This grass is rapidly grow, very high productivity. Perennial grass with 8 years life.

It was good opportunity to me that I was observed the livestock sector in Thailand specially Feed & Forage laboratory and Machine milking at Murrah Buffalo Farm without using of oxytocin or suckling of calf to buffaloes.

So I hope in near future we can develop such kind of animal nutrition technology extension services to the farmers of Sindh.

Findings (Fodder) Dr. Muhammad Arif Khan

In Thailand mostly rain fall 1,100 mm / year and they cultivate maize, Napier Grass and rice straw Pasture land and mostly farmers have their own land. Their nutrition Labs were also well developed and making good quality TMR rations for member farmer groups. TMR feeding to cattle's play vital role for increase milk production.

For silage making Water compressor of 5HP Hydraulic is very good machine. Preparation of Hay, Silage and TMR making used by Thai dairy farmers were very effective for increase of milk production.

In Sindh there is a good irrigation system for fodder production so if we cultivate Napir grass (mott grass) that's very helpful for small scale rural farmers for fodder available round the year and silage making and TMR production in respect of getting more milk production.

OBSERVATIONS/ FINDINGS:

During the visit of Saraburi Province of Thailand, it was observed that Thai government has taken serious efforts for institutional development of Livestock sector in very short period. Physically visited and observed their on-going activities and methodology like Farmers training program, milk collection system, milk quality check, Animal nutrition analysis and role and responsibilities of Dairy cooperatives especially calves raring mechanism for increasing the assets of farmers and providing the different types of Loan, total mixed ration and Animal health cover to their registered farmers is really admirable.

During the visit of Thai milk cooperatives livestock officers of Saraburi Province briefed that their Animal Health group works on Disease surveillance, Vaccination campaign, Promotion of disease-free farms, Increase efficiency of bio-security, Public awareness from animal diseases, Control animal's movement and Disease control. In case of Brucellosis they advise the farmers for culling of affected animals and farmers strictly follow their advices @ 50/50 compensation. It was also briefed, that in Thailand no anybody is allowed to treat the diseased animal except qualified Veterinarian and they are following proper disinfection protocol, but on the other side real situation was different which was observed during the visit of Small scale farmer "Winai Kumpiranon" on 20th May 2017 , he shared that "he him-self" performs the treatment to his own animals and also providing the Veterinary services to other farmers on cost basis, the available kit for treatment was not according to standard of disinfection. He also shared that normally he treats the animals suffered from ketosis, Anaplasmosis, Mastitis and Matritis as per clinical findings without any laboratory diagnosis.

Findings (Animal Reproduction) Dr. Ali Akhtar Shahani

Findings:

1. **Murrah Farm -** Madam Runchuan was not happy with present condition of farm due to low production and economic loss. Weight gain during growing period in young stock is very low, this increase the age at first calving (five years) this is due to late maturity. The overall body condition score of majority of buffalo is 2. There is less support from reproduction technicians and co-operatives working in the area.

2. **Under D.P.O. Complete Circle Operation -** ongoing training course on artificial insemination to promote and give basic learning and technology transfer was seen during visit at DPO training center.

3. During visit Pak team have no chance to meet with Livestock Reproduction Specialist/ andrologist to know about data available on reproductive issues and treatment in cattle and buffaloes in Thailand.

Recommendations:

1. Project on improvement of buffalo production reproduction should be started with the collaboration of buffalo raising country.

2. Collaboration and cooperation on research conducted in reproduction between the technicians and Sharing of knowledge and techniques for the diagnosis and treatment of reproductive issues in male and female cattle and buffaloes.

Observation:

It is a fact that Livestock sector in Thailand has been remarkably developed with in short span of time due to well-planned policies and positive role of Thai Government as well as creative and productive cooperation and coordination of all involved stakeholders of this sector.

In Thailand there was no indigenous Cow and Buffalo Dairy Breeds, the Livestock population was composed of different exotic breeds such as Holstein, Jersey, Brahman, Red Dane, Red Sindhi, Sahiwal and Thai native, 92% of cows in this population are cross bred and vast majority of them are composed of a large Holstein fraction and small fraction of another breeds. All of these animals are raised under the Thai-tropical environment. Experts are striving to develop Thai native breed containing 4 to 5 breed's blood which can adopt and survive into local conditions and environment.

In this regard The Dairy promoting Organization (DPO) had initiated the Genetic Improvement project and programmed from 1996 according the statement of Genetic Improvement expert of DPO, in starting they selected and registered 200 good potential dairy cows of 70 farmers considering the following traits.

1. Body Score of cow
2. Age of 1st service
3. Age at 1st calving
4. Lactation yield
5. Lactation length

At present 500 registered farmers and more than 2,000 pedigree registered animals have been included in this program for the further Genetic Improvement.

Through this Genetic Improvement Program up to this time 15 proven sires, 60 to 80 elite Dam, 300 to 400 elite daughters of proven sires and 6 progeny tested Bulls have been produced. While

2000 doses of semen from each progeny tested bull and 12,000 doses per year are being collected and distributed in the population through Artificial Insemination services.

Findings:

Though DPO Genetic Improvement program and Model of cattle in Thailand seems result-oriented and successful but in the Sindh province is not applicable, because they have mixed five breed blood to produce sub-tropical breed for Thailand, and we have various good and pure indigenous breeds which exist since long time with high production potential and adaptability into severe environment and rough management. So we have to develop our own Genetic Improvement model for buffalo and cattle according to our ground realties and situations based on progeny testing program.

Findings:

In Thailand farmer keeping calf without mother feed milk through bucket/feeder. The calf without mother is good procedure is good because farmer feed milk as proper as calf need. The procedure of calf rearing in Thailand is kept individual hatch feed only fresh milk 4liter/day/calf up to one month of age after that they started calf starter with roughages up to 3months of age with rejected milk/ skim milk, they cause diarrhea. From 4th months of age they stop milk and starts feed TMR 14% 30kg/day/calf with green fodder mixed till heifer pregnant 6 months of age. They also feed mineral supplements. Thai farmer provide water after stop milk, this practice is not good. They provide water from very first day. The rejected milk/skim milk reduce the expenditure cost but cause diarrhea and low weight gain i.e. 10kg/months. The cooperatives purchased the calf at the age of 2 months at the rate of 3000baht but the actual expenses at the farm is round about 4200 baht only for milk other expenses is not included i.e. cost of calf, management, labor cost etc. and cooperative keep the calf till 6 months parturition and then return to farmer at the rate of 50000 baht. The actual expenses at cooperative farm is 40000 baht and cooperative earned 10000 baht. This practice is good because farmer concentrate only on milking animals. The cooperative paying less amount as an initial cost my suggestion is that cooperative increase initial cost because the actual expenses is more then they pay to farmer and risk factor in first two months is high as compare to rest of life. The actual expenses on calf at cooperatives is 4200 baht/calf. The mortality rate is very low because calf kept at cooperative farm and at their farm, they have technical people/trained staff.

The government providing loan as low as 2.5 to 3% with 3 years grace period to livestock farmer for encouraging the people to come in this business and earn good profit. The grace period for repayment is 3 year is good and helpful to farmer for establishing their farm and easily repay original cost as well as interest.

7. Conclusions

The exposure visit to Thailand was a good experience, it provided us to learn overall current status of the livestock sector and efforts of the Thai Govt. for the development of this sector. It was well managed and provided us an opportunity to understand the present situation of Livestock department, working of Co-operatives, Small scale farmers and calf rearing.

- **Co-operative:**

Contribution of co-operatives for provision of veterinary services, technical guidance, calf rearing and feed supply to the farmers seems to be good model and can be replicated in Sindh.

- **Calf rearing:**

Rearing calves on mother milk for two weeks and then feeding skim milk supported by TMR can also be tried in Sindh

8. Recommendations

1) The Co-operative system in Thailand need more study and also study other co-operatives in different countries. The Co-operative system can be started with the collaboration of other donor agencies/NGO in small scale as a model and gradually increase to all Sindh province.
2) The calf rearing technique can be started on trial basis in our calf salvation center, if the cost is reduced and weight gain good, low mortality then propagate to other farmers.
3) The silage making model on small scale can be introduced in our pilot villages because of its cheaper and easily make.

Annex:

I. Photo Report

Photo Report of Orientation Session

	
Group Photo	Orientation
	
Dr. Iqtadar presents Ajrak	Dr. Jatoi presents book

Photo Report of DLD Visit

	
Visit of DLD Bangkok	Group Photo
	
Introduction to Deputy D.G (DLD)	Group Discussion with Deputy D.G (DLD)

Photo Report of Meat Market Visit

	
Fruit, Vegetable, Meat & Fish Market	Fruit Market
	
Meat Market	Vegetable Market
	
Fish Market	Shops

Photo Report of Murrah Farm

	
Briefing by Owner of Murrah Farm	Explanation of reproduction calander by C/P's
	
Machine Milking at Murrah Farm	Dr. Rukhsana & Dr. Jatoi presents tradi

Photo Report of Medium Scale Farm Visit

	
Collecting data at medium scale farm (Mr.Sultan Shah)	Slaughter House

	
Farm Shed & Paddock	
	
Group Photo	Calf Rearing Shed

Photo Report of 2nd Largest Thai Milk Cooperative Visit

	
Briefing given by Chairman Thai Milk Cooperative	Chairman Thai Milk Cooperative
	
Calf Rearing Farm	Preparation & packaging of TMR
	
Group Photo at Calf Rearing Center (Thai Milk Cooperatives)	Visit Thai Dairy Cooperative.

Photo Report of DPO Visit

	
Briefing by In charge Dairy Promotion Organization(DPO)	Calf Hatches
	
Group Photo	Group Photo at DPO Milk Cooperative
	
First Danish- Thai Farm	Briefing at milk cooperative (DPO)

Photo Report of Mittraphab Milk Collection Center Visit

	
Mittraphab Milk Collection Center	Present Traditional Gift (Ajrak) to Incharge Milk collection Center
	
TMR Packaging Process	Group Photo

Photo Report of Feed & Nutrition Center Visit

	
Visit Feed & Nutrition Center	Nutrition Laboratory Visit
	
Farm Visit at Feed Nutrition Center	Biotechnology Lab Visit
	
Group Photo	Group Photo

	
Visit Calf Shed	Present Ajrak to Farmer By Dr. Arif
	
	Visit of Small Scale Farm

Photo Report of Debriefing / Wrap up Session

	
Wrap up seesion	Wrap up session chair by Dr. Jatoi & Dr. Arif
	
Dr. Safdar presents action plan	Dr. Shahani presents action plan
	
Wrap up session discussion	Present Ajrak to Dr. Tominaga San by Dr. Safdar

Group Photo

	
Group Photo at Novotel Hotel Bangkok	Garden Valley Resort, Saraburi

II. Itinerary

Date	Day	Time	Activities
13-May-17	Sat	21:10 PM	Assemble at Jinnah Airport
		23:50 PM	Leave Karachi for Bangkok by TG-342
14-May-17	Sun	6:40 AM	Arrive at Bangkok
		8:30 AM	Arrive at Hotel
		8:30 AM to 17:00 PM	Orientation (General knowledge about Thailand, Travelling tips, Explanation about schedule) Lecture about overview of Livestock Sector in Thailand
15-May-17	Mon	AM	Visit to Department of Livestock Development Courtesy Call to DG DLD
		PM	PM: Visit to Milk and Meat market in the city
16-May-17	Tue	AM	Visit to Murrah farm in Chachoengsao province
		PM	Visit to Sultan Shah Farm in Saraburi province
17-May-17	Wed		Visit to Thai Milk Cooperatives in Lam Phaya Klang District Saraburi province along with Dairy Herd Helth Unit
18-May-17	Thu		Visit to Dairy Farming Promotion Organization of Thailand Visit Milk farmer's Mittraparb cooperatives in Saraburi
19-May-17	Fri	AM	Visit to Nutrition Center in Pak Chong, Nakorn Rachashima Province
		PM	Visit to Small Scale Farmer
20-May-17	Sat	AM	Leave for Bangkok
		PM	Group Discussion Among Participatns Debriefing session
21-May-17	Sun	10:00 AM	Leave Hotel for Airport
		14:10 PM	Leave Bangkok for Karachi by TG-507
		17:10 PM	Arrive at Karachi, proceed to Hyderabad

III. List of Participants

	Name	Title	Organization
1	Dr. Ghulam Muhammad Jiskani	Veterinary Officer, Livestock and Fisheries Department, Government of Sindh (Counterpart for Livestock Farm Management)	Livestock and Fisheries Department, Government of Sindh, Pakistan
2	Dr. Iqtidar Ali Memon	Epidemiologist, Livestock and Fisheries Department, Government of Sindh, Pakistan (Counterpart for Marketing)	Livestock and Fisheries Department, Government of Sindh, Pakistan
3	Dr. Safdar Ali Fazlani	Technical officer (Development), Office of the Directorate General Livestock Sindh, Government of Sindh, Pakistan (Counterpart for Feeding Management)	Livestock and Fisheries Department, Government of Sindh, Pakistan
4	Dr. Muhammad Arif Khan	Veterinary Officer, Livestock and Fisheries Department, Government of Sindh, Pakistan (Counterpart for Fodder Development and Production)	Livestock and Fisheries Department, Government of Sindh, Pakistan
5	Dr. Zulfiqar Ali Pathan	Research Officer, Livestock and Fisheries Department, Government of Sindh, Pakistan (Counterpart for Animal Health)	Livestock and Fisheries Department, Government of Sindh, Pakistan
6	Dr. Ali Akhtar Shahani	Senior Veterinary Officer, Livestock and Fisheries Department, Government of Sindh, Pakistan (Counterpart for Livestock Reproduction)	Livestock and Fisheries Department, Government of Sindh, Pakistan
7	Dr. Muhammad Mubarak Jatoi	Senior Veterinary Officer, Livestock and Fisheries Department, Government of Sindh, Pakistan	Livestock and Fisheries Department, Government of Sindh, Pakistan

		(Counterpart for Livestock Genetic Improvement)	
8	Dr. Naeem Siddique Ansari	Senior Veterinary Officer, Livestock ad Fisheries Department, Government of Sindh, Pakistan (Counterpart for Livestock Assets)	Livestock and Fisheries Department, Government of Sindh, Pakistan
9	Dr. Rukhsana Vigio	Research Officer, Office of the Directorate Animal Husbandry Livestock Sindh, Government of Sindh, Pakistan (Counterpart for Training)	Livestock and Fisheries Department, Government of Sindh, Pakistan

Name of Japanese participants

	Name	Title
1	Dr. Hideo TOMINAGA	Expert on Livestock Technology Development 1
2	Ms. Fumiko IKEGAYA	Deputy Team Leader, Expert on Marketing / Farm Management 2
3	Ms. Noriko HARA	Expert on Livestock Technology Development 2 / Project Coordinator

List of Thai Coordinator

	Name	Title	Organization
1	Dr. Rangsun PARNPAI	Associate Professor	Suranaree University of Technology
2	Mr. Thatawt YODRU	PhD candidate	Suranaree University of Technology

IV. List of Persons Met

Name	Title	Organization
Tossaporn Srisakdi	Deputy Director General	Department of Livestock Development
Wutipong Intarathan	Chief of Academic Development Group	Department of Livestock Development
Sinchai Ruengpaibul	Dairy Extension Expert	Department of Livestock Development
Krongkaew Borisutsawat	Senior Animal Scientist	Department of Livestock Development
Boondharika Krajangwongs	Veterinary Officer	Department of Livestock Development
Akarim Mogthaisong	Foreign Relation Officer	Department of Livestock Development
Tanamad Tikampon	Foreign Relation Officer	Department of Livestock Development

Name	Title	Organization
Runchuan Hengtrkulsin	Farm Owner	Murrah Dairy Company Limited

Name	Title	Organization
Sultan Shah	Farm Owner	Bhombila Dairy Farm

Name	Title	Organization
Chawengsak Sanguan-wongijit	Chairman	Thai Milk Cooperative
Waraporn Prompanjai	Head of HR	Thai Milk Cooperative
Preecha Tanureaung	Assistant Manager	Thai Milk Cooperative
Patcharapun Chuenarom	Admin	Thai Milk Cooperative
Satitpong Promsatit	Veterinary Doctor	Animal Health Group, Saraburi Provincial Livestock Office
Aranya Jullapanont	Veterinary Doctor	Dairy Herd Health Unit, DHHU
Thitichaya Tuansoongroen	Animal Husbandry	Dairy Herd Health Unit, DHHU
Chonlada Thongdee	Veterinary Doctor	Dairy Herd Health Unit, DHHU
Wanna Tikamklm	Artificial Inseminator	AI Unit
Jaded Mongmark	Artificial Inseminator	AI Unit
Tawtchai Homkrajea	N/A	N/A
Sontnat cheomgukam	N/A	N/A

Name	Title	Organization
Thamnoon Thongprapai	Chief of Farm Division	Dairy Farming Promotion Organization of Thailand

Name	Title	Organization
Sarayut Thaikua	Scientist	Animal Nutrition Research and Development Center
Rattikan Poungkaew	Scientist	Animal Nutrition Research and Development Center
Pichet Chanpeng	Animal Husbandry	Animal Nutrition Research and Development Center
Yaowalak Mangpang	Scientist	Animal Nutrition Research and Development Center

Name	Title	Organization
Winai Kumpiranon	Farm Owner	Small Scale Farmer

Attachment 5-1 List of Equipment for the First Year

The following shows the list of the equipment provided to the Project and the list of the materials purchased for appropriate livestock technology development.

List of Equipment

	Name of Equipment	Model Number	Q'ty
1	Ultrasonic System Diagnostic Scanner	HS101V	2
2	Drying Oven with Constant Uniform temperature	DK340S	1
3	Electric Scale	UW820SV	1
4	Centrifugal Separator for Milk fat	H150	1
5	Constant Temperature Water Bath for Gerber Butyrometer		1
6	Hoof trimming tools	NFN181	1
7	Copy Machine	Canon IR-ADV CC2230	1
8	Air Conditioner	Mitsubishi 1.1 ton Mr. Skin Series F13VC	2
		Mitsubishi 1.5 ton Mr. Skin Series F18VC	2
9	Desktop Personal Computer	Dell OptiPlex	1
10	Laptop Personal Computer	Acer V5-5-72p-6858 Ci5	1
		HP 15-d008se Core i5	1
		Dell5323 Core i7	1
11	Generator	45 kVA Perkins	1
12	Metal shoot set for weight measure	Local Model	5
13	Weighting Indicator	Gallagher Weigh scale W210	1
		Local Model	4
14	Weighting Load bar	Gallagher Loadbar Set 2000kg 600MM	1
		Local Model	4
15	Vaginal Speculum	NFA161	1

Materials for Livestock Appropriate Technology Development

	Item	Qty	Unit
1	Overalls	100	Nos
2	Caps	200	Nos
3	Ice Box	5	Nos
4	Ice Pack	16	Nos
5	Manger	60	Nos
6	Water trough with wood stand	60	Nos
7	Material for Milking Shed	13	Sets
8	Apron for hoof work	2	Nos
9	Concentrated feed for trial use	1000	Kg
10	Small scale for milk yield measure	12	Nos
11	Weighing tape	8	Nos
12	Platform for weight measurement	6	Nos
13	Digital maximum and minimum thermometer	20	Nos
14	Standard substance mineral for assessing laboratory analytical capacity	1	Set
15	Standard substance crude protein for assessing laboratory analytical capacity	1	Set
16	Soil-sampling hand auger with standard edge type	1	Nos
17	Soil-sampling hand auger's grip handle	1	Nos
18	Adjusting handle for soil-sampling hand auger (50cm)	1	Nos
19	Internal anthelmintic	1	Set
20	Other medicines	1	Set
21	Tester for mastitis 500mL	10	Nos
22	PL tester petri dish	10	Nos
23	Automatic syringes	1	Set
24	Supersensitive grove (for rectal palpation)	10	Nos
25	Estrogen, hormone drug	1	Set
26	Heat mount detector	9	Box
27	Easy breed Estrus synchronization CIDR-B	10	nos
28	Applicator for Easy breed	2	nos
29	Straw semen tubes, 133, 0.5mL	2	nos
30	Straw powder	2	nos
31	Dilating bougies for cow and heifer, Yasutaka-Type	2	nos
32	Intrauterine injectors for cow	1	nos
33	Echo jelly	3	nos
34	Surgical operating gown L	3	nos

	Item	Qty	Unit
35	Surgical operating gown M	13	nos
36	Surgical operating gown C	13	nos
37	Reproductive organs	1	set
38	Long boots	20	nos
39	Numbered ear tag, double lock L-L set	1000	nos
40	Ear tag applicator	14	nos
41	Gerber butyrometer	10	nos
42	Rubber plug for Gerber butyrometer	20	nos
43	Volumetric pipette (for cow milk)	3	nos
44	Volumetric pipette (for acid)	3	nos
45	Volumetric pipette (for butyrometer)	3	nos
46	Pipette brush (for butyrometer)	3	nos
47	Sulfuric acid specific gravity tester	2	nos
48	Alcohol specific gravity tester	2	nos
49	Specific gravity test cylinder	2	nos
50	Milk specific gravity tester (15-40 gravity tester range with thermometer)	2	nos
51	Alcohol meter	2	nos
52	Sample bottle with rid	33	nos
53	Amyl alcohol reagent 500mL	2	nos
54	Sulfuric acid reagent 500mL	2	nos
55	Buffalo calf	10	heads
56	Milk for sucking		
57	Calf starter		
58	Feed for calves		
59	Salt mineral supplement for calves		
60	Vaccine, and internal/external anthelmintic for calves	1	set
61	Medicines / Chemicals for calves		
62	LP gas		
63	Basic bed for labors	1	nos
64	Tools/equipment		
65	Feeding bottles	3	nos
66	Calf hatch	10	nos
67	Wire net	1	set
68	Log for fencing	1	set
69	Basic tent	1	set
70	Antiseptic (lime)		

	Item	Qty	Unit
71	Antiseptic (cresol)		
72	Wheelbarrow	2	nos
73	Plastic sheet	1	set
74	Tape measure	10	nos
75	Spray paint	10	nos
76	Manger for calf-distributed farmers	60	nos
77	Water trough with metal stand for calf-distributed farmers	60	nos
78	Vaccine and anthelmintic for calf-distributed farmers		
79	Digital scale for milk measurement	9	nos
80	Gloves for chemical resistance (for sulfuric acid)	5	nos
81	Protection glass for sulfuric acid use	5	nos
82	Stand for volumetric pipette	1	nos
83	Milk test bottle stand	2	nos
84	Milk test bottle	1	nos
85	Dispensing burette 1Liter volume (measure 1mL)	1	nos
86	Dispensing burette 1Liter volume (measure 10mL)	1	nos
87	Metal medicine saucer	2	nos
88	Test kit for Brucellosis	1	nos
89	Disinfection box	1	nos
90	Feed mixing box	1	nos
91	Time switch	1	nos
92	Divider	1	nos
93	Refrigerator	1	nos
94	Data logger for temperature and humidity	1	nos
95	Plug-in Sensor for Data logger for temperature and humidity	1	nos
96	digital temperature and humidity meter	1	nos
97	Sensor for Digital temperature and humidity	1	nos
98	Irrigator	1	nos
99	Silicon Tube	1	nos
100	Pinchcock	1	nos
101	Catheter for drug delivery	1	nos
102	Stomach tube	2	nos
103	Counter	1	nos
104	Induction plate	1	nos
105	Micro Pipette	2	nos
106	Smear needle	1	nos

	Item	Qty	Unit
107	Reagent for breed	1	nos
108	Gravimeter for colostrum	2	nos
109	Flask 250mL	1	nos
110	Flask 50mL	1	nos
111	Bottle	2	nos
112	Glass funnel	2	nos
113	Plastic funnel	1	nos
114	Measuring cylinder 25mL	2	nos
115	Measuring cylinder 50mL	2	nos
116	Measuring cylinder 100mL	2	nos
117	Laboratory film	1	nos
118	Centrifuzer	1	nos

Attachment 5-2 List of Equipment for the Second Year

List of Equipment

	Name of Equipment	Model Number	Q'ty
1	Multi-function water quality meter (pH meter)	MM-60R	1
2	pH detector	CT-571B	1
3	Calorimeter	AP-1000M	1
4	Nitrogen digestion apparatus	NDG-200	1
5	Nitrogen distillation apparatus	NDS-200	1
6	Soxhlet abstractor	SF-6	1
7	Caliper	NFK66	1
8	Ejaculator		1
9	Cutting mill	SM200	1
10	UPS		1
11	Printer Drum for Canon IR-ADV CC2230	Drum Magenta	1
		Drum Yellow	1
		Drum Cyan	1
		Drum Black	
12	Weighting Indicator	Local Model	2
13	Weighting Load bar	Local Model	2
14	Iron Pipe Race	Local Model	1

Attachment 5-3 List of Equipment for the Third Year

List of Equipment

	Name of Equipment	Model Number	Q'ty
1	Projector	Sony VPL DX-102	1
2	UPS for projector	Stabmatic 1000VA	1
3	Electrical Balance	Precious Balance Adam, UK	1
4	Air Conditioner	Dawlance 1.5 ton	1
5	Desktop Personal Computer	HP400G3 Corei5	1

Attachment 5-4 List of Equipment for the Fourth Year

List of Equipment

	Name of Equipment	Model Number	Q'ty
1	Air Conditioner	Kenwood 1.5 ton	1
2	Air Conditioner	TCL-24CSA/IA 2 ton	4
3	Air Conditioner	TCL-18CS/JET 1.5 ton	3

Attachment 5-5 List of Handed-Over Equipment

Year	Item	Model No.	Currency	Price	Region	JICA Office in Charge	Purpose	Place of Use	Date of Purchase	Remarks
1st	Ultrasonic System Diagnostic Scanner	HS101V	JPY	828000.000	Asia	Pakistan Office	Project	Project Site	2014/4/24	
1st	Ultrasonic System Diagnostic Scanner	HS101V	JPY	828000.000	Asia	Pakistan Office	Project	Project Site	2014/4/24	
1st	Drying Oven with Constant Uniform Temperature	DK340S	JPY	192000.000	Asia	Pakistan Office	Project	Project Site	2014/3/26	
1st	Electric Scale	UW820SV	JPY	123200.000	Asia	Pakistan Office	Project	Project Site	2014/4/17	
1st	Centrifugal Separator for Milk fat	H150	JPY	570000.000	Asia	Pakistan Office	Project	Project Site	2014/4/24	
1st	Constant Temperature Water Bath for Gerber Buryrometer		JPY	250000.000	Asia	Pakistan Office	Project	Project Site	2015/4/24	
1st	Hoof trimming tools	NFN181	JPY	142500.000	Asia	Pakistan Office	Project	Project Site	2015/4/24	
1st	Copy Machine	Canon IR-ADV CC2230	PKR	850000.000	Asia	Pakistan Office	Project	Project Site	2015/12/18	Black and white print and scan are functioning. Color print is out of order
1st	Air Conditioner	Mitsubishi 1.1 ton Mr. Skin Series F13VC	PKR	56000.000	Asia	Pakistan Office	Project	Project Site	2014/3/6	
1st	Air Conditioner	Mitsubishi 1.1 ton Mr. Skin Series F13VC	PKR	56000.000	Asia	Pakistan Office	Project	Project Site	2014/3/6	
1st	Air Conditioner	Mitsubishi 1.5 ton Mr. Skin Series F18VC	PKR	70600.000	Asia	Pakistan Office	Project	Project Site	2014/3/6	
1st	Air Conditioner	Mitsubishi 1.5 ton Mr. Skin Series F18VC	PKR	70600.000	Asia	Pakistan Office	Project	Project Site	2014/3/6	
1st	Desktop Personal Computer	Dell OptiPlex	PKR	153500.000	Asia	Pakistan Office	Project	Project Site	2014/12/18	
1st	Laptop Personal Computer	Acer V5-5-72p-6858 Ci5	PKR	76000.000	Asia	Pakistan Office	Project	Project Site	2014/3/15	Out of order
1st	Laptop Personal Computer	HP 15-d008se Core i5	PKR	68000.000	Asia	Pakistan Office	Project	Project Site	2014/3/17	
1st	Laptop Personal Computer	Dell5323 Core i7	PKR	72000.000	Asia	Pakistan Office	Project	Project Site	2014/11/7	
1st	Generator	45kVA Perkins	PKR	1610000.000	Asia	Pakistan Office	Project	Project Site	2014/3/21	Out of order
1st	Metal shoot set for weight measure		PKR	613554.000	Asia	Pakistan Office	Project	Project Site	2014/10/27	5 sets for pilot farmers
1st	Weighting load bar with indicator	Gallagher Weigh scale W210 & Load bar set 2000kg 600MM	USD	1618.520	Asia	Pakistan Office	Project	Project Site	2014/10/21	
1st	Weighting load bar with indicator		PKR	75000.000	Asia	Pakistan Office	Project	Project Site	2014/9/11	
1st	Weighting load bar with indicator		PKR	75000.000	Asia	Pakistan Office	Project	Project Site	2014/11/27	
1st	Weighting load bar with indicator		PKR	110000.000	Asia	Pakistan Office	Project	Project Site	2014/12/17	
1st	Weighting load bar with indicator		PKR	100000.000	Asia	Pakistan Office	Project	Project Site	2015/1/19	
2nd	Multi-function water quality meter (pH meter)	MM-60R	JPY	265000.000	Asia	Pakistan Office	Project	Project Site	2015/2/24	PRI Karachi
2nd	pH detector	CT-571B	JPY	52000.000	Asia	Pakistan Office	Project	Project Site	2015/2/24	PRI Karachi
2nd	Calorimeter	AP-1000M	JPY	180000.000	Asia	Pakistan Office	Project	Project Site	2015/2/24	PRI Karachi
2nd	Nitrogen digestion apparatus	NDG-200	JPY	292000.000	Asia	Pakistan Office	Project	Project Site	2015/3/5	PRI Karachi
2nd	Nitrogen distillation apparatus	NDS-200	JPY	360000.000	Asia	Pakistan Office	Project	Project Site	2015/3/5	PRI Karachi
2nd	Soxhlet abstractor	SF-6	JPY	350000.000	Asia	Pakistan Office	Project	Project Site	2015/3/5	PRI Karachi
2nd	Caliper	NFK66	JPY	69540.000	Asia	Pakistan Office	Project	Project Site	2015/2/19	
2nd	Ejaculator		USD	1295.000	Asia	Pakistan Office	Project	Project Site	2015/7/8	PRI Karachi
2nd	Cutting Mill	SM200	EUR	14201.000	Asia	Pakistan Office	Project	Project Site	2015/6/9	PRI Karachi
2nd	UPS		PKR	71000.000	Asia	Pakistan Office	Project	Project Site	2015/8/4	This is consumable. It should be deleted from the register of JICA Pakistan Office.
2nd	Printer Drum for Canon IR ADV CC2230 Magenda		PKR	57452.000	Asia	Pakistan Office	Project	Project Site	2015/11/12	Ditto
2nd	Printer Drum for Canon IR ADV CC2230 Yellow		PKR	57452.000	Asia	Pakistan Office	Project	Project Site	2015/11/12	Ditto
2nd	Printer Drum for Canon IR ADV CC2230 Cyan		PKR	57451.000	Asia	Pakistan Office	Project	Project Site	2015/11/12	Ditto
2nd	Weighting Indicator and load bar		PKR	107000.000	Asia	Pakistan Office	Project	Project Site	2015/11/23	
2nd	Weighting Indicator and load bar		PKR	107000.000	Asia	Pakistan Office	Project	Project Site	2015/11/23	
2nd	Iron Pipe Race		PKR	62200.000	Asia	Pakistan Office	Project	Project Site	2015/12/30	
3rd	Projector	VPL DX-102	PKR	55000.000	Asia	Pakistan Office	Project	Project Site	2016/6/20	
3rd	UPS for Projector	Stabmatic 1000VA	PKR	22800.000	Asia	Pakistan Office	Project	Project Site	2016/6/20	
3rd	Electrical Balance	Precision Balance Adam	PKR	118650.000	Asia	Pakistan Office	Project	Project Site	2016/12/9	PRI
3rd	Air Conditioner	Dawlance 1.5 ton	PKR	50000.000	Asia	Pakistan Office	Project	Project Site	2016/3/7	
3rd	Desktop Personal Computer	HP400G3 Corei5	PKR	106000.000	Asia	Pakistan Office	Project	Project Site	2016/8/9	
4th	Air Conditioner	Kenwood 1.5 ton	PKR	62000.000	Asia	Pakistan Office	Project	Project Site	2017/4/20	
4th	Air Conditioner	TCL-24CSA/IA 2 ton	PKR	76000.000	Asia	Pakistan Office	Project	Project Site	2017/9/18	PRI Karachi
4th	Air Conditioner	TCL-24CSA/IA 2 ton	PKR	76000.000	Asia	Pakistan Office	Project	Project Site	2017/9/18	PRI Karachi
4th	Air Conditioner	TCL-24CSA/IA 2 ton	PKR	76000.000	Asia	Pakistan Office	Project	Project Site	2017/9/18	PRI Karachi
4th	Air Conditioner	TCL-24CSA/IA 2 ton	PKR	76000.000	Asia	Pakistan Office	Project	Project Site	2017/9/18	PRI Karachi
4th	Air Conditioner	TCL-18CS/JET 1.5 ton	PKR	58000.000	Asia	Pakistan Office	Project	Project Site	2017/9/18	
4th	Air Conditioner	TCL-18CS/JET 1.5 ton	PKR	58000.000	Asia	Pakistan Office	Project	Project Site	2017/9/18	
4th	Air Conditioner	TCL-18CS/JET 1.5 ton	PKR	58000.000	Asia	Pakistan Office	Project	Project Site	2017/9/18	

Attachment 6-1-1 Minutes of the Consultation Meeting (August 2014)

Type of Meeting	Consultation Meeting - Briefing to Directors about the project activities
Date /Time	26th August 2014 11:00 to 13:00
Participants	Dr. Abdullah Mewati, Director General, Livestock (Research) Sindh Dr. Aslam Parvez Umrani, Director of Central Veterinary Diagnostic Laboratory Tando Jam (CVDL) Dr. Tauseef Umeer Farooqi, Director of Poultry Production & Research Dr. Mushtaque H. Jokhio, Livestock Development Officer, Sindh Dr. Noor-u- Nisa Mari, Technical Officer at D.G Office Dr. Abdul Qadir Junejo, Director of Animal Breeding Sindh Dr. Siraj Ahmed Isani, Director of Animal Husbandry Sindh Dr. Jameel Ahmed Shaikh, Project Manager/ Director of Planning Mr. Hiroshi Okabe, Team leader/ Institutional development Dr. Hideo Tominaga Livestock technology development Ms. Fumiko Ikegaya, Deputy team leader/ Marketing Ms. Noriko Hara, Livestock technology development and coordination Mr. Haruka Ryu, Training management Dr. Ghulam Sarwar, Shaikh, General Coordinator Dr. Rasool Bux Soomro, Technical Coordinator (Recorded by)
Place	D.G meeting room
Meeting agenda	1. Introduction of the project, Japanese expert and project staff 2. Brief report of the project 3. Progress of project activities and planned activities 4. Project design matrix(PDM)

Introduction

- The meeting was started with self-introduction of the entire participants one by one.
- Mr. Okabe explained the purpose of the meeting is to brief project outline, progress so far, planned activities of the 1st year and Project Design Matrix draft before the Project Steering Committee (PSC) to the directors.

1. Brief report of the project

- Mr. Okabe gave brief reporting of the project using PowerPoint slide as attached. He also mentioned that the project will hold the PSC and the Livestock Development Platform during the first year.

2. Progress of the project activities since February 2014, and planned activities until January 2015

- Mr. Okabe presented progress of activities so far, plan till Jan 2015 and the Checklist for the appropriate technologies as attached. Regarding the Checklist, Mr. Okabe explained that all technologies are ranked A to C based on importance and easiness of adoption, and the Checklist is to be used mainly by the extension workers to monitor every 6 months to what extent each technology is

being disseminated. The project targets 20% of target farmers (1500 out of 7500) to adopt appropriate technologies which are ranked A on the Checklist.

3. Questions and suggestion from participant during meeting

The following is the summary of discussions among the participants:

(PSC)

- Dr. Aslam Pervez Umrani indicated that representation from Planning & Development Department and Finance Department has not been included in the composition of the PSC. The PC-1 shall be referred and action may be taken accordingly.
- Dr. Sarwar confirmed that there will be representation of both these departments on the PSC and they will be invited.
- Dr. Abdul Qadir said we should invite Vice Chancellors of Sindh Agriculture Tando Jam and Shaheed Benazir Bhutto University of Veterinary & Animal Science Sakran (SBBUVAS) to the PSC as stakeholder. Mr. Okabe answered that they would be invited to the Livestock Development Platform in January 2015, not the PSC.
- Dr. Aslam suggested that, before the PSC, members may be provided agenda and summary paper for the meeting highlighting the main points for which we need decisions/advise from the PSC so that when members attend the meeting they can contribute. The summary paper should include information which may be confirmed during PSC such as the total number of animals owned by 11 pilot farmers, targeted livestock, selection criteria of the pilot farmers and so on.
- He also suggested that in the project brief for the participants of the PSC meeting, detailed introduction sheet with pictures and others details like e-mail contact and designations of the Japanese experts showing their counterpart staff shall be included.

(Livestock insurance)

- Dr. Mushtaque Jokhio suggested that in the project we have to cover the risk factors of animals and livestock insurance companies may be involved.
- Mr. Okabe replied that the team would visit India and be able to see the case there.

(Salvation of calves)

- Dr. Aslam proposed that our target is to invite industrial people to expand the mechanism once the cost-effectiveness of calf salvation is proved. Although calves are slaughtered, the demand of calves is quite high. There are many way to expand the mechanism; The government of Sindh may either provide hundreds of calves or provide necessary material to people who want to start salvation of calves by themselves.
- Dr. Sslam also mentioned that a research on milk replacer is on-going and milk replacer with 50% of buffalo milk was succeeded in Patoki. He said that he was informed it when he visited Patoki with Minister.

(Technology training conducted by the Project)

- Dr. Abdul Qadir mentioned that any officers at his department were not selected as counterpart for this Project. He said that he will appreciate if there is a chance for officers at his department to learn through this Project.

- Dr. Aslam added that it has been observed that the project is arranging short trainings through Japanese experts only for counterpart staff with the subjects of milk fat testing, somatic cell counts, etc. He suggested that technical staff from relevant directorates may also be invited to participate in these trainings. This will help in maintaining the sustainability of the technology.
- Dr. Tominaga said that he is planning to provide trainings for rectal palpation in this December and will welcome officers other than counterparts.
- It was agreed that point is well taken and in future the sphere of the participation in these trainings will be broaden.

(Breeding improvement)

- Dr. Abdul Qadir Junejo questioned about breeding services using AI and natural services in regard to improvement of breeding.
- Dr. Tominaga explained the concept of community bull and his observations on Semen Production Unit Karachi and Rohri and highlighted the process through which AI services will be improved based on improving semen quality and test inseminations. He further added that concept of community bulls will be considered.

(Fodder)

- Dr. Siraj Issani proposed to develop model of farming system for farmers who own land.
- Dr. Sarwar explained that the Project will develop models for each farmer's type.

(Difference of technology between buffalo and cattle)

- Dr. Siraj Issani said that in developed countries mostly cattle is reared resulting development of technologies suitable for cattle dairy farming, but here in Sindh, buffalo is the major dairy animal. How technologies developed for cattle will be useful to buffaloes?
- Dr. Tominaga explained that the basis of the technologies is almost the same but of course there are differences in feeding, breeding, management and other technologies. But experts have gained experience during the master plan study and this knowledge will be used to develop appropriate technologies suitable for buffalo dairy farming.
- Dr. Aslam mentioned that Tuberculosis test of buffalo is difficult because of thickness of skin.
- Dr. Tominaga appreciated the information.

(Collaboration with the Directorates)

- Dr. Tauseef Umeer Farooqi mentioned that he had welcomed the team to PRI laboratory before. And he said that he will appreciate if the team pay attention to the laboratry.
- Dr. Sarwar appreciated the participation of Director of Poultry Production & Research and explained the participants that the nutrition laboratory of PRI would be utilized by the project.
- Dr. Aslam invited the experts to visit the CVDL to see the available facilities regarding testing of brucellosis and tuberculosis.
- Dr. Tominaga appreciated the invitation and agreed to visit CVDL.
- Dr. Aslam suggested that we have to increase the percentage of vaccine both H.S and FMD mentioned in the Checklist of technology development. He said FAO imported the vaccine of FMD and their cost Rs.50/= dose and yearly Rs.100/=.
- Dr. Noor Nisa Mari suggested one day we have to organize that all the Director visit the activity of the

pilot farm in field.

- Dr. Aslam said today we are all directors here and what expectations from our side?
- Mr. Okabe replied that today it was the first meeting with directors and we introduced the project activities and progress. The project is not implemented simply for the project, but is related to the activities of the whole Department, such as how the project activities are planned, monitored, and evaluated. Therefore, we need to share the results of the project to the whole Department. In future we will respect your ideas and suggestions.

4. Final remarks (D.G Livestock Research)

- DG Livestock said today discussion was very informative, and the briefing of the project, and progress were overall very good and it's my first time to have meeting with the project, I am thankful to all of you for today participants.

Attachment 6-1-2 Minutes of the First Steering Committee Meeting

Minutes of Meeting

Type of Meeting	• **First Project Steering Committee Meeting**
Date /Time	10th September 2014 11:00 to 13:30
Participants	Members of the Steering Committee, JICA representatives from HQ and Islamabad Office, Local staff
Place	Indus Hotel Hyderabad
Meeting Agenda	• Recitation from Holy Quran • Introduction of the participants • Welcome address • Key note address • Over all project plan & progress • Detail plan & progress on technology development • Open discussion • Closing remarks

- Secretary Livestock & Fisheries presided the meeting
- **Recitation from Holy Quran** by Dr. Muhammad Arif
- **Introduction of the participants.**
  Dr. Jameel Shaikh requested all the participants for introduction of oneself.
- **Well come address**
  Dr. Ali Akber Soomro Director General Livestock Sindh/Project Coordinator welcomed all the participants specially Secretary Livestock & Fisheries Government of Sindh. He described the object of the meeting and requested the participants to contribute in the meeting very actively.
- **Key note address**
  Dr. S Hirashima delivered the key note address
  1. He mainly highlighted the role Agriculture and Livestock in economic development and contribution in GDP based on following points:
     - Growth with high employment development revisited.
     - How to make agriculture more positive in development.
     - How to deal with surplus labour
     - How to improve resource management and structural problem.
  2. Poverty Reduction strategy
     - Poverty line based on the consumption basket.
     - Importance of asset on a hedge against risk and uncertainty.
  3. Increasing role of the high value added sub-section: horticulture and livestock.
     - The share of food grain and livestock in GDP
     - The mix farming food-nutrient security and social net
  4. Significance of calf salvation scheme in context of poverty reduction and resource management.

In cattle colonies there are so many calves slaughtered daily, he suggested to think about it and find solution for rearing specially in the rural areas where people can get benefit and support.

5. Task ahead

Standardization of appropriate technologies.

Institutional innovation.

- **Overall project plan & progress**

Mr. Okabe delivered the presentation on the overall project view, objects, activities, progress and plans. He raised three issues and requested the Chair for necessary support on immediate solution:

i) Recruitment of staff for the project as per PC-1.

ii) Project allowance for counterpart staff

iii) Purchase of vehicles for the project as per PC-1

- **Detail plan & progress**

Dr. Ghulam Muhammad Jiskani delivered the presentation regarding detail plan and up to date progress and the role of counterpart staff.

Project activities, progress and schedule of each C/P field

Details of the pilot farms from the process of the selection up to final selection.

- **Q/A and Open discussion**

Dr. Ghulam Sarwar Shaikh facilitated the open discussion and responded the questions of the participants with the support of experts.

- Dr. Mushtaque Ahmed Jokio asked the question about the genetics he said it is not possible to cover issue of genetic in limited time how project is working on this issue?
- Dr. Mubarak Ahmed Jatoi responded that project will develop foundation towards genetic improvement and the department of Livestock will further continue on it.
- Mr. Shahabuddind Memon Chief Planning (Agriculture) asked that whether the project will also develop collaboration with other projects working in livestock sector?
- Dr. Ghulam Sarwar responded that project will not be working in isolation but will develop close collaboration with other stakeholders working in this sector and to initiate this a meeting of the Livestock Development platform will be conducted in January 2015, where all the players from livestock sector will be invited.
- Dr.Abdullah Mewati raised the question about the mortality rate in calves reared during master plan study?
- Dr. Tominga explained that mortality rate in calves was 12%. I understand it was high but let me tell it was an experiment where we tried different milk replacers just to find out the suitable one.
- Dr. Abdul Qadir Junejo discussed about the number of dry buffaloes transported from Karachi to other parts of the country by train and identified this as a main reason for slaughter of dry buffaloes.
- Dr. Ghulam Sarwar responded that from 1970 till 1985 the Pakistan Raiways (PR) use to subsidize the cost of transportation of livestock from Karachi to other parts of the country up to 50% but after that PR withdrawn the subsidy and as a result farmers started transportation of livestock by road.
- Dr. Abdul Qadir Junejo asked that how AI services will be improved?
- Dr. Tominaga explained the pathway regarding improving semen quality and test inseminations.

- Dr. Aslam Parvez Umrani , he said first of all I appreciate the presentation of Dr. Jiskani which was very good with confidence and the speech of Dr. Hirashama to highlight the role of Agriculture and Livestock sector in GDP role that was very informative for all of us.
- Dr. Umrani discussed on the calf rearing activities which is very important economical point of view we have to focus on it very closely and see other options also for the success of these activities. We can work with micro finance bank or NGO to support the rural people to rear calf.
- Dr. Hirashima said that working with micro finance institutions is not recommended because recovery period is too long, it is important to explore other possibilities.

Secretary Livestock Dr. Abdul Rahim Soomro remarks.

- He thanks to all participants specially guest travelling from Japan and Islamabad
- The speech of Dr. Hiroshima was remarkable to shared view on the entire sector of Agriculture and GDP contribute.
- He appreciated the project progress and activities which are going on.
- He was very impressed from team working in project and cooperation with each other.
- He specially thanks the JICA Japan who helps us in livestock sector development in Sindh.
- He said I am interested in Sindh brand and great potential and resources already in Sindh province and one day we expect our Sindh brand milk/meat export worldwide.
- He is interested to visit the pilot farms and know about the pilot farms in details, he showed the interest to participate in farmers trainings.
- He assured immediate solutions of the raised issues of recruitments process, vehicles and C/P project allowances.
- He suggested that this type of forum we have also invite the district officers to know and aware about the project activities.

- **Closing remarks**

  Mr. Okabe thanks to all participants and ideas from all of the participants shared.

  He said it's our pleasure secretary participated and gave us good motivation.

  He said we are very glad to see that our counterparts are confident and proud of what they are doing now. He said that we will make a minor mistake but at its initial period we are trying many approaches. He appreciates for further support from the participants on the success of the project.

List of Participants

	Name of Participants	Designation/Expertise
1	Dr. Abdul Rahim Soomro	Secretary Livestock & Fisheries Sindh
2	Dr. Ali Akbar Soomro	D.G Livestock /Project coordinator
3	Dr. Abdullah	D.G Livestock (Extension & Research)
4	Dr. Aslam Parvez Umrani	Director veterinary Research CVDL, Tando Jam
5	Dr. Tauseef Umeer Farooqi	Director Poultry Production
6	Dr. Mushtaque H. Jokio	Livestock development Officer
7	Dr. Noor-u- Nisa Mari	Technical Officer D.G Office
8	Dr. Abdul Qadir Junejo	Director Animal Breeding Sindh
9	Dr. Siraj Ahmed Isani	Director Animal Husbandry Sindh
10	Mr. Shahabuddind Memon	Senior Chief (LS &F)
11	Dr. M. Ibrahim Shaikh	VO, Sindh Secretariat department
12	Dr. Shigemochi Hirashima	JICA /HQ Japan
13	Ms. Yoshie Sasabe	JICA /HQ Japan
14	Mr. Satoshi Hamano	JICA/ Pakistan
15	Mr. Amir Bukhari	JICA / Pakistan
16	Dr. Jamil Ahmed Shaikh	Project Manager/ Director Planning
17	Dr. Ghullam Muhammad Jiskani	Farm Management
18	Dr. Safdar Ali Fazlani	Feeding Management
19	Dr. Muhammad Arif Khan	Fodder Development and Production
20	Dr. Ali Akhtar Shahani	Livestock Reproduction
21	Dr. Zulfiqar Ali Pathan	Animal Health
22	Dr. Muhammad Mubarak Jatoi	Livestock Genetic Improvement
23	Dr. Naeem Siddique Ansari	Livestock Assets
24	Dr. Iqtadar Ali Memon	Marketing
25	Dr. Rukhsana Vighio	Training (Extension)
26	Dr. Ghulam Sarwar Shaikh	General Coordinator
27	Dr. Rasool Bux Soomro	Technical Coordinator
28	Mr. Hiroshi Okabe	Team Leader/Institutional Development
29	Ms. Fumiko Ikegaya	Deputy Team Leader/Marketing
30	Dr. Hideo Tominaga	Livestock Technology Development
31	Dr. Yoshio Chiba	Genetic Improvement 2
32	Ms. Mika Kawamoto	Livestock Extension Services /Gender
33	Mr. Haruka Ryu	Training Management
34	Ms. Noriko Hara	Livestock Technology Development and Coordination

Attachment 6-1-3 Minutes of the First Livestock Development Platform Meeting

Minutes of Meeting

Type of Meeting	First Livestock Development Platform Meeting
Date /Time	20th January 2015 10:00 to 17:00
Participants	63 participants (participants are listed at the end of the document)
Place	Indus Hotel, Hyderabad
Meeting agenda	・ Recitation from Holy Quran ・ Introduction of participants ・ Well come address ・ Keynote address ・ Presentation on project features progress and plan 2015. ・ Highlights of field activities and presentation ・ Group discussion ・ Presentation of Group Discussions by group leaders ・ Views of the participants, NGOs, Private Sector, Donor projects, University, Progressive farmers, Farmer from cattle colony ・ Future Guideline address ・ Vote of thanks
Attachment	-

1. **Recitation from Holy Quran by Dr. Muhammad Arif**
2. **Participants introduced themselves**
3. **Welcome address by Director General Livestock Sindh, Dr. Ali Akbar Soomro,**
   Welcomed the participants and highlighted the projects outputs
4. **Keynote address by Dr. S.Hirashima Senior Advisor, JICA**

Dr. S. Hirashima briefed the significance of the Project in the context of development in Pakistan as shown below.

- Growth strategy should lead towards social stability. The livestock sector is the engine of growth in agriculture in terms of labour intensity with higher value addition, as well as a prescription for the accumulated surplus labour in rural areas, in particular females labour.
- Sindh has comparative advantage in the livestock sector comparing to Punjab. Livestock sector in Sindh is a prescription for the reduction of regional disparity with pride and dignity.
- Livestock development in the framework of the mixed farming serves the purpose of attaining food and nutrient security, and social safety net in rural areas.
- This project would be consistent with direction of future livestock development in Pakistan. The increasing demand should be met by the genetically superior quality of cattle and buffaloes, not by increasing the number of animals.
- Lastly, we have to refer to the role of the state, the department of livestock for our poverty reduction strategy (PRS) by focusing on five ways; The basically 1) to institutionalize the three schemes in our

PRS 2) to develop appropriate technologies for the successful implementation, in particular the reduction of mortality rate of calves being distributed and the early predication of pregnancy 3) to help strengthening the credibility of our target group of household in terms of credit and insurance 4) to help formulating Sindh livestock standard and control adulteration and livestock excreta from the colonies and 5) to ensure the supply of clean water.

5. Presentation on project features progress and plan 2015

Mr. Hiroshi Okabe, the Team Leader of JICA Project Team gave the presentation and explained the whole project activities of the first year.

6. Highlights of field activities and presentation

Four groups of the counterparts gave the presentation on their respective fields, and explained the progress of the Project for the first year (2014-15) and the future plan for 2015-16.

Group1: Livestock Management and Marketing by Dr. Ghulam Muhammad Jiskani and Dr. Iqtadar Ali Memon

Group2: Fodder, Feeding Management and Livestock Assets by Dr. Safdar Ali Fazlani, Dr. Muhammad Arif Khan and Dr. Naeem Siqqique Ansari

Group3: Livestock Reproduction and Animal Health by Dr. Ali Akhtar Shahani and Dr. Zulfiqar Ali Pathan.

Group4: Livestock Genetic Improvement by Dr. Muhammad Mubarak Jatoi and Mr. Ali Haider Shah, President of Breeders Association District Matiari.

7. Question & Answer Session

Dr. Ghulam Sarwar Shaikh, General Coordinator of JICA Project Team facilitated the session.

Q By: Dr. Lutif Ali Talpur: Breeder from District Tando Muhammad Khan

Are there latest techniques available for pregnancy diagnosis in animals like in human beings, such as ultrasound etc? What are the available facilities for the investigation of Brucellosis and tuberculosis in animals?

A By Dr. Ali Akhtar Shahani: Counterpart on Livestock Reproduction

(The available techniques like rectal palpation and ultrasound for pregnancy diagnosis in animals were explained and the available facilities were brought in the knowledge of the participants.)

A By Dr. Aslam Pervaz Umrani: Director Veterinary and Diagnosis Sindh

Multiple methods and facilities to diagnose the diseases in reproduction like brucellosis are available in the laboratory. Our team already surveyed in some districts and collected the sample for analysis. And sometimes our team visit farmers for the diagnosis when farmers request. (*He also informed the participants regarding diagnosis of tuberculosis in animals.)*

Q By Dr. Muhammad Afzal: Project Coordinator of FAO Project on FMD

Why small ruminants are not included in project activities as small ruminants are also very important for rural farmers?

A By Mr. Hiroshi Okabe: Team Leader of JICA Project Team

Large ruminants have been focused because of the priority by pilot farmers. It does not mean that we assume small ruminants are not important. Small ruminants will also be considered under some other interventions.

Q By Dr. Khuda Bux Mirbahar: Vice chancellor of Shaheed Benazir Bhutto University of Veterinary and Animal Sciences Sakrand

I appreciate JICA team for inviting to the platform meeting which is well organized event. The numbers of pilot farmers is very small and the average milk production is not reliable because of small sample size of farmers and their animals. Animals which produce only one to two litter of milk are not milking animals but dry animals. Recycling the animals is very important, and it is needed to focus training young generation from technical point of view. Women have very important role in livestock development. We have to take realistic approach. Moreover departmental services are poor, then how can farmers be benefitted?

A By Dr. Ghulam Sarwar Shaikh: General Coordinator of JICA Project Team

The number of pilot farmers is small because at the initial stage appropriate technology is to be developed, applied and verified at small scale to avoid losses. And after verifying it, it will be disseminated to all farmers in the province. So in this way, only successful technologies will reach to farmers. I hope you will realize that in the beginning a small step leads towards big step.

A By Dr. Abdul Qadi Junejo: Director Animal Breeding Sindh

It is a fact that departmental services needs to be enhanced but the reason is only non-availability of trained manpower. However the point is well taken, and efforts will be made to increase the status of services.

Q By Mr. Ramzan Buriro: Engro Foods Limited

During the presentation by counterparts, it has been mentioned that only small percentage of farmers market their milk through marketing channels in Sindh, while the fact is that a large percentage market their milk through market channels like our company. I am doubtful about the data.

A By Dr. Ghulam Sarwar Shaikh: General Coordinator of JICA Project Team

These figures are based on the result of our 13 pilot farmers in 5 districts, not whole Sindh. We expect your cooperation in future for this Project.

8. Group formation and discussions on Output 1,2,3 and 4 by dividing the participants into 4 groups.

The participants were asked to move and join the groups as per four outputs of the project and their interest. All the participants took active part in the group discussions and nominated the group leaders to present the outcome of the discussions.

Group 1: Presenter - Dr. Iqtadar Ali Memon and Dr. Ghulam Muhammad Jiskani

Theme: Output 1: Appropriate technologies and management for livestock development are developed through on-farm application at the pilot farms with gender consideration.

(1) Farm management

- Awareness program for modern farm management at union council level
- Need of technical expert trainers
- Awareness through FM radio channels and print media such as brochures literature

(2) Marketing

- Quality and hygienic of milk are very important
- Installation of the bulk coolers with solar system
- Proper policy for market price of the milk
- Development of the market channels at the grass root levels

(3) Feeding Management

- Introduction and availability of the formulated feed (toxin free)
- JICA experts shall provide to the stakeholders provide feed formula for milk, meat, dry animals and calves
- Supply of feed to different category of animals according to their production

(4) Fodder

- Awareness about the important of fodder for milk production
- Preservation of the fodder by silage
- Introduction of small low cost silage machines
- Introduction of the Rhode grass seeds

(5) Reproduction

- Introduction of proven bulls into herds
- Determination of the right time of the heat
- Introduction of A.I techniques and high quality semen available at low cost.

(6) Animal Health

- De-worming and vaccination regularly
- Regular visit of technical staff to the rural areas
- Farmer's day weekly or monthly for general management of animals

Group 2: Presenter - Dr. Muhammad Afzal Project Coordinator FAO FMD Project Islamabad

Theme: Output 2: Methods for utilizing livestock resources. i.e salvation of buffalo calves revolving of dry buffaloes are verified

- Initial colostrum feeding at calving
- Purchase of calf may need to be done as late as possible (colostrum antibiotics test)
- Study and consult on the trials have already been conducted for calf rearing, and different calf rearing models has been practiced by farmers (the Project needs to involve farmers who are interested in calf rearing)
- Learning from calf raising experiments and call meeting of experts for SOP development.
- Well-controlled environment
- Dry Buffalos re-cycling and revolving
- Social context is important

- Various models are already existing, the Project should study them and learn the lesson
- Identification of the proper recipient is very important
- The Department should involve community and provide free vaccination and treatment.
- Reproduction is an important issue, and solution for using oxytocin is needed.

Group 3: Presenter - Mr. Ramzan Buriro from Engro Food Limited

Theme: Output 3: The verified appropriate technology and the methods for utilizing livestock resources are disseminated in the pilot districts.

- Dissemination of appropriate technology
- Approach targeting Individual and Mass Communication through print and electronic media
- Group formation at village level
- Maximum 25 members of male or female trainings
- Demonstration (seeing is believing)
- Activities at union council level
- Third party reference
- Beneficiary will take on your behalf.

Group 4: Presenter - Dr. Muhammad Mubarak Jatoi

Theme: Output 4: The capacity of the livestock department for project planning, management and coordination is strengthened

- Coordination with government, private and other institutes and signs MOU for technical areas.
- Periodical trainings program for staff
- Establish system for monitoring the project
- All vacant posts need to be filled by the Department
- Collaborate between the government and other private organizations, and share activities farmers to farmers.
- Selection criteria for management trainings must be reviewed by the Department
- Utilize the trainings for others staff members.

9. Comments from Participants.

1) Mr. Muhammad Azam Qureshi, State Bank of Pakistan

The facility for lending money is available with the banks, and livestock farmers can take benefit by borrowing money for livestock development. I assure all necessary help from my side.

2) Mr. Jameel Memon, Large dairy farmer in Karachi

I am rearing calves by feeding them cow milk directly from cow, allocating one teat for each calf. The cross-breed cow produces 20L of milk per day and can feed 4 to 5 calves easily. I visited USA where they focus on water quality. Quality of drinking water for calves is also very important, I suggest the farmers to offer water which you yourself can drink to the calves. Colostrum for calf is very important in first 12 hours because after that colostrum loose quality. I don't measure how much milk calves should

take. I suggest you should provide colostrum as much as calves need. Loan should be offered to farmers with low markup rate.

3) Mr. Haji Haider bux Chalgari, Cattle colony farmer Hyderabad

This project is good for farmers and should support to small farmers in rural areas. Reproduction is big issue, and no facility for pregnancy diagnosis is available for farmers. Pure breed is very difficult to find. Badin is the only district where you can find pure Kundi breed. The facility of ultra sound machine for farmers at Union Council level should be provided.

4) Dr. Muhammad Afzal, Project Coordinator of FAO, FMD Project Islamabad

I appreciate JICA Project Team for the activities in livestock development and providing me the information regarding project. I now have full understanding of the project activities, so project management should note that hereafter I am your ambassador in Islamabad and will be informing all the concerned about the activities of this project. I offer full cooperation for providing preventive measures against FMD nad PPR diseases to the pilot farmers and breeders on cost sharing model.

5) Mr. Ramzan Buriro, Engro Foods Limited

JICA objective is poverty reduction in Sindh, specially focusing on rural areas of Sindh and working with small scale farmers. Engro Foods has a milk plant in Sukkur and collects milk throughout Sindh. Engro Foods has one large dairy farm of crossbred cows in Nara Sukkur. We are 2nd largest milk processing company in Pakistan. We extend full cooperation to develop marketing channel for the pilot farmers.

6) Dr. Mujeeb-ud-Din Sahrai, Vice Chanceller Sindh Agriculture University Tando Jam

First of all thanks to JICA for inviting to this platform meeting. Very good and useful discussions have taken place during the day and I am delighted to see the interest of all the stakeholders for livestock development. We have different departments such as animal nutrition, livestock management, dairy technology and so on. And we offer our full cooperation to the Project and look forward to share activities in future. The University has opened five farmer desks where farmers can bring their issue and we will reply feedback them with solutions within 2 to 3 days. The farmers to get get benefit of these desks.

7) Mr. Noor Ahmed Leghari, Secretary Livestock

I am thankful to all of you especially Japanese who came from Japan and Islamabad. I basically belong to rural area and just joined the Department. Thus I am not technically much aware of livestock. Pakistan is agriculture country and the GDP mainly depends on livestock sector. It's my dream to realize a green revolution in livestock sector. We have resources, and development should be done by scientifically way. The government tries the best to develop livestock sector. I welcome to anybody who want to meet with me or come to my office for any technical issues, suggestions or discussions.

I appreciate the JICA livestock development project in Sindh. Sindh government is ready to invest in

livestock sector.

8) Dr. Ghulam Sarwar Shaikh, General Coordinator of JICA Project Team

Thanks to all participants, today was very productive day. The platform meetings will be conducted regularly every year during remaining four years of the project. I hope many of the participants developed new contacts today and will be cooperating with each other in near future.

10. Dr. Jameel Ahmed Shaikh, Project Manager of JICA project

I am thankful on behalf of my project team to all of you to participate in the platform meeting. Thanks for your contributions.

<< Participants list >>

S#	Name of Participants	Designation/Expertise
1	Mr. Shahabuddin Memon	P&D department Karachi
2	Dr. Shigemochi Hirashima	JICA mission (Tokyo)
3	Ms. Ayumu Ohshima	JICA mission (Tokyo)
4	Mr. Hitoshi Fujiie	JICA mission (Tokyo)
5	Mr. Motoo Taki	JICA Pakistan
6	Mr. Satoshi Hamano	JICA Pakistan
7	Mr. Amir Ahmed Bukhari	JICA Pakistan
8	Dr. Abdullah	ILRI Islamabad
9	Dr. Muhammad Afzal	Project Coordinator FAO
10	Mr. Ramzan Buriro	Engro Foods
11	Dr. Mujeeb	Vice Chancellor Tando Jam University
12	Dr. K. B. Mirbahar	Vice Chancellor Sakrand University
13	Dr. Fatah Muhammad Soomro	Professor Sakrand University
14	Mr. Shamsuddin	NRSP, NGO
15	Mr. Suleman G. Abro	CEO ,SAFWCO
16	Dr. Lal Kumar	SAFWCO
17	Mr. Arif Rajput	ICI Pakistan
18	Dr. Irshad Ali	ICI Pakistan
19	Mr. Muslim Raza	SMEDA
20	Mr.Ali Haider shah	Breeders Matiari farm
21	Dr. Lutf Ali Talpur	Farmer
22	Mr. Fakhar Naseem	Farmer
23	Mr. Jameel Memon	Farmer
24	Mr. Naeem	Farmer
25	Mr. Ghulam Sarwar Dars	Farmer
26	Mr. N. Monoo	Farmer
27	Dr. Pershotum	Assistant Professor Tando Jam University
28	Dr. Amir Amanullah Solangi	Associate Professor Tando Jam University
29	Mr. Iqbal Ahmed	ZTBL, Bank
30	Mr. Muhammad Ismail	ZTBL, Bank
31	Dr. Aijaz Kumbhar	ASLP, Project
32	Dr. Sobia Majeed	ASLP, Project
33	Dr. Ali Akbar Soomro	D.G, Livestock Sindh
34	Dr. Siraj Ahmed Isani	Director Animal Husbandry
35	Dr. Abdul Qadir Junejo	Director Animal Breeding
36	Dr. Junaid rao	Director Poultry department
37	Dr. Tauseef Umer	Director Poultry Production Karachi

S#	Name of Participants	Designation/Expertise
38	Dr. Aslam Parvez Umrani	Director CVDL, Tando Jam
39	Dr. Mahmood	Deputy Director Tando Allahayar
40	Dr. Muhammad Naeem	Deputy Director Badin
41	Mr. Muhammad achar Kerio	Agriculture Extension Hyderabad
42	Dr. Nuzhat Jabeen	Animals breeding department
43	Dr. Noornisa Mari	Livestock Department
44	Dr. Muzafar Ali	Livestock department
45	Dr. Raheel Laghari	Livestock Department
46	Dr. Jamil A. Shaikh	Project Manager, Project Counterpart, Livestock Department
47	Dr. Ghullam Muhammad Jiskani	Farm Management Specialist, Project Counterpart, Livestock Department
48	Dr. Muhammad Mubarak Jatoi	Livestock Genetics Specialist, Project Counterpart, Livestock Department
49	Dr. Zulfiqar Ali Pathan	Animals Health Specialist, Project Counterpart, Livestock Department
50	Dr. Muhammad Arif Khan	Fodder Specialist, Project Counterpart, Livestock Department
51	Dr. Iqtadar Ali Memon	Marketing Specialist, Project Counterpart, Livestock Department
52	Dr. Rukhsana Vighio	Training Specialist, Project Counterpart, Livestock Department
53	Dr. Ali Akhtar Shahani	Livestock Reproduction Specialist, Project Counterpart, Livestock Department
54	Dr. Naeem Siddique Ansari	Livestock Assets Specialist, Project Counterpart, Livestock Department
55	Dr. Safdar Ali Fazlani	Feeding Management Specialist, Project Counterpart, Livestock Department
56	Mr. Hiroshi Okabe	Team Leader/Institutional Development, JICA Project Team
57	Dr. Hideo Tominaga	Livestock Technology Development, JICA Project Team
58	Ms. Fumiko Ikegaya	Deputy Team Leader/Marketing, JICA Project Team
59	Ms. Norika Hara	Livestock Technology Development and Coordination, JICA Project Team
60	Ms. Mika Kawamoto	Livestock Extension/Gender, JICA Project Team
61	Dr. Ghulam Sarwar Shaikh	General Coordinator, JICA Project Team
62	Dr. Rasool Bux Soomro	Technical Coordinator, JICA Project Team
63	Mr. Asim Shaikh	Assistant, JICA Project Team

Attachment 6-2-1 Minutes of the Second Steering Committee Meeting

Conclusions of Meeting Report

Type of Meeting	• **2nd Project Steering Committee Meeting 2015**
Date /Time	28th May 2015, Timing 11:00 to 13:30
Participants	Counterparts/Local staff/Japanese expert/Directors/Secretary
Place	Indus Hotel Hyderabad
Meeting Record by	Dr. Rasool Bux Soomro
Meeting Agenda	• Recitation from Holy Quran • Introduction of the participants • Well come address • View of JICA Pakistan Office for the Project • Overall project plan for 2nd year, progress & Issues • Detail plan, progress & issues for livestock technology development • Open discussion • Closing remarks.

- **Recitation from Holy Quran** by Dr. Muhammad Arif

- **Introduction of the participants.**
  Dr. Jameel Shaikh requested to all participants for introduction one by one.

- **Well come address**
  Dr. Ali Akber Soomro D.G Livestock well come to all participants in Second Project steering committee, he said that as the Project Coordinator, it is my pleasure to welcome all of you to participate in the Second Project Steering Committee Meeting of the Project on Sustainable Livestock Development for Rural Sindh.

  With continuing population growth, economic development, depleted land resources, we can expect the increasing pressure on Livestock resources. Our task of providing appropriate technologies to the rural farmers for sustainable Livestock Development has become more important than ever before.

  To address the issue, the Project for the "Master Plan Study on Livestock, Meat and Dairy Development in Sindh Province" was conducted by JICA and Sindh Livestock Department since July 2010, and the Master Plan report was prepared in October 2011.

  Based on the Master Plan report, the Project on Sustainable Livestock Development for Rural Sindh was launched in February 2014, by concentrating its activities in the districts of, Hyderabad, Tando Muhammad Khan, Matiari, Tando Allahyar and Badin.

  The project purpose is Establishment of "Development Foundation" in the target districts in 5 years (2014 to 2018). The "development foundations" means technologies, human resources, and institutions that would be the bases of long-term development of the livestock sector.

  During the first year (2014) Project has accomplished a lot of activities, such as:
  1. Selection of 13 pilot farmers
  2. Preparation of technology development plan
  3. Conduct of on-farm application of technologies
  4. Collection of data
  5. Conduct of market –related survey
  6. Project management trainings

Mr. Okabe and counterpart staff will brief you the progress in detail later. All these activities were jointly conducted by the Japanese Experts and Counterpart staff of the project.

In this steering committee meeting, we have three major tasks at hand:
1) Review Overall project plan for the second year, progress and issues
2) Review the activities held in 2014
3) Guidance for the project

He further said that I am quite certain that our meeting and discussion will prove to be most useful and beneficial to all the stakeholders.

- **Views of Representative JICA Pakistan Office Mr. Satoshi HAMANO**

He mainly briefed about the support from JICA to various sectors in Pakistan. He informed that JICA is supporting a project on Horticulture in KPK and on Informal education in Punjab and this project in Sindh. The JICA investment on this project in Sindh is the highest than any other project of JICA in other countries.

Since this project is based on the Master plan study conducted by JICA so we are quite sure that project will create success stories. The main object is to establish foundations of livestock development based on:
1. Development of appropriate technologies and extension
2. Human resource development (capacity and motivation)
3. Institutional development (execution and coordination)

He further said that with the joint efforts of the team of experts from Japan and local counterpart staff, project will be able to achieve above objectives.

- **Overall project plan for second year, progress & Issues**

Mr. Hiroshi OKABE, Team Leader (JICA Side) delivered the presentation on the expected results by the project in the 5 years, and the goals after the project, by insisting that the sustainability of the project is most important which all of us should take into account. He then explained the overall project Plan for second year, progress and Issues as under:

Output 1- (Project plan first year)
- Selection of 13 pilot farms
- Preparation of technology development plan
- Conduct of on-farm application of technology and collection of the data
- Training on livestock technology

Output 1- (Project plan 2nd year)
- Selection of 12 pilot farms
- Continue to verify appropriateness of livestock technology
- Conduct of market related survey
- Training on livestock technologies
- Preparation of technology guideline (1st draft)

Output 2- (Project plan first year)
- Setup of experimental farm (Calf salvation center)
- Preparation of calf management plan
- Introduction of calves to the calf salvation center

Output 2- (Project plan 2nd year)
- Distribution of calves to farmers (trial)
- Study on traditional sharing practice in rural Sindh

- Planning and verification of effective methods for utilizing calves.

Output 3- (Project plan first year)
- Conduct of PRA survey
- Interview to extension related organizations

Output 3- (Project plan 2nd year)
- Continuation of PRA survey
- Training to Master Trainer and Extension workers
- Establishment of the taskforce team and preparation of the action plan
- Preparation of extension plan, methods, and materials
- Start the extension activities (from Sept.2015)

Output 4- (Project plan first year)
- Preparation of operational guideline (1st draft)
- Training (pilot basis)

Output 4- (Project plan 2nd year)
- Training
- Establishment of the Taskforce Team and preparation of the Action Plan.
- Application of project management method
- Preparation of SOP 1st draft.

Mr. Okabe also raised some issues with Secretary Livestock as below:

Current Issues related to extension
- Absence of officers and staff trained and responsible for extension works in the Department
- No organizational structure to disseminate livestock technologies
- No extension methods verified
- Therefore, can the Department really take a role for disseminating livestock technologies in future?

Current Issues related to project management
- No guiding policy/strategy for good project planning
- No monitoring and reporting system in the department
- Therefore, not clear whether the annual development plan of the department are producing good results
- No human resource development activities (no training, no performance evaluation)
- Therefore, can the Department really take an initiative to promote the livestock sector?

Major Issues related to the implementation of the project
- Delay of action (recruitment/allocation of project staff, allocation of project vehicles, project allowance)
- No permanent officers responsible for the project implementation beyond the project team level (at the Secretariat)

Suggestions
- Allocation of one permanent and senior officer at the secretariat level in Sindh Govt. responsible for the project
- Assign full-time project coordinator and project manager.

- **Detail plan, progress, and issues for Livestock Technology Development - by Dr. Ghulam Muhammad Jiskani**

Dr. Jiskani delivered presentation regarding progress made by each counterpart staff in the area of:
- Farm management

- Feeding management
- Fodder development
- Animal reproduction
- Animal health
- Genetic improvement
- Marketing

He also presented the plan for the Second year for each above areas and shared the issues for livestock technology development.

- **Open discussion, Facilitator Dr. Ghulam Sarwar Shaikh**

Dr. Ghulam Sarwar Shaikh facilitated questions and answers session and open discussion with the participants**.**

- Dr. Aslam Parvez Umrani (Director CVDL)
He said first of all I am thankful JICA team for developing the skills of counterpart staff and appreciated the presentation made by Dr. Jiskani which was very good and informative. Dr. Umrani said we are already working very close with project activities specially laboratory services and JICA already provided the materials and kits to carry out virus testing activities.

He appreciated that with efforts of the project team one Senior Research Officer will visit Japan to undergo training on PCR Methodology and after completing training in Japan he will carry out Pvirus tests using PCR Technology which will help CVDL to conduct gene sequencing. It will be great contribution and support for CVDL from the project.

- Dr. Ali Akbar Soomro (D.G Livestock)
He appreciated the project activities and said that during the project activities a valuable data is being generated by the counterpart staff and suggested that counterpart staff of the project may be allowed to use this data for their higher education like MSc and PhD. The ways and means can be discussed with the Vice Chancellor Sindh Agriculture University Tando Jam for the purpose.

- Dr. Tominaga
He replied the valuable data still has to be verified so, after completion of this process permission for using this data for the purpose of higher education can be considered. He suggested that point has been well taken and further consultation on this issue will be done some time in August/September this year.

- Dr. Touseef Umer Farooqui (Director Poultry Production & Research)
He said that he is thankful to Project Management for inviting to attend the meeting of Project Steering Committee and appreciated the project activities.

He said that with the support of the Project nutrition laboratory in Poultry Research Institute is being upgraded and concerned technician are trained by the Japanese experts. He said that with joint efforts we will be able to establish state of the art Nutrition laboratory in PRI. He appreciated the supply of new equipment and training of the staff for the lab. He suggested that in future JICA consider also project on poultry as well.

- Dr. Abdul Qadir Junejo (Director Animal Breeding)
He appreciated the project activities specially the focusing on the animals reproduction side which is very good because livestock facing two major issues 1) Slaughtering of dry buffaloes and 2) slaughtering the calves in cattle colonies. He appreciated the JICA initiative on calf salvation. He asked when project start to work on dry buffaloes salvation?

Dr. Sarwar replied we have started the calf salvation and very soon we will start activities on dry

buffalo's salvation because still we are working on collecting the data of sharing system and experts working on understanding the traditional sharing system. He said we will be starting the First trainings on reproductive disorders from June 02, 2015. Dr. Ono a world renounced expert of this field has arrived and will conduct the training. He invited the Director Animal Breeding to inaugurate the training.

-Dr. Hafeez (P&D Department)

He thanked the project management for inviting for the meeting and said that, he has been monitoring the activities of the project in the field and found that activities are objective based and to the point. We know the field activities and level of the rural farmers. He said we received two summaries, one was regarding the project allowance and 2nd was regarding project vehicles and informed that P&D Department has already forwarded to these summaries with positive comments to the Chief Minister for approval, we will always support project.

- **Secretary Livestock Mr. Noor Muhammad Leghari remarks.**
  - He said first of all I thank the JICA team and experts who helps us in livestock sector development in Sindh.
  - He appreciated the ongoing project progress and activities
  - He was very impressed from team working in project and cooperation with each other
  - He specially thanks the JICA Japan who helps us in livestock sector development in Sindh.
  - The project objects are to increase the milk and meat production of rural Sindh, with proper methods of management and technical guidance.
  - He said I will try my best to resolve the issues highlighted by Mr. Okabe regarding recruitment process, project vehicles and C/P project allowances.
  - He said summaries for the project allowance and project vehicles are already sent to Chief Minister for approval, and I will take efforts for approval.
  - He showed interest to visit the pilot farms

- **Closing remarks.**

  Mr. Okabe thanked all the participants regarding their active participation in the meeting.

List of participants

S#	Name of Participants	Designation/Expertise
1	Mr. Noor Muhammad Leghari	Secretary Livestock & Fisheries Sindh
2	Dr. Hafeezur Rehman Kghoro	P&D Department
3	Mr. Abid Hussain Quresh	Director, Agriculture Farms and Groups Development
4	Dr. Ali Akbar Soomro	D.G Livestock /Project coordinator
5	Dr. Aslam Parvez Umrani	Director veterinary Research 7 Diagnosis CVDL, Sindh Tando Jam
6	Dr. Tauseef Umeer Farooqi	Director Poultry Production & Research Sindh Karachi
7	Dr. Abdul Qadir Junejo	Director Animal Breeding Sindh
8	Dr. Jameel Ahmed Shaikh	Project Manager/ Director Planning
9	Dr. Noor-u- Nisa Mari	Focal person, TF project mgt, Technical Officer D.G Office
10	Dr. Raheel Leghari	Focal person, TF extension structure, Technical Officer D.G Office
11	Mr. Satoshi HAMANO	JICA/ Pakistan
12	Mr. Amir Bukhari	Senior Programme Manager JICA Pakistan Office
13	Mr. Hiroshi OKABE	Team Leader (JICA Side)
14	Dr. Hideo TOMINAGA	Livestock Technology Expert
15	Mrs. Fumiko IKEGAYA	Deputy Team Leader/Marketing
16	Dr. K. Ono	Animal Reproduction Expert
17	Ms. Mika KAWAMOTO	Extension/Gender Specialist
18	Dr. Ghulam Sarwar Shaikh	General Coordinator
19	Dr. Rasool Bux Soomro	Technical Coordinator
20	Dr. Rashid Ahmed Nizamani	Local consultant
21	Dr. Safdar Ali Fazlani	Feeding Management Specialist
22	Dr. Muhammad Mubarak Jatoi	Livestock Genetics Specialist
23	Dr. Ghullam Muhammad Jiskani	Farm Management Specialist
24	Dr. Zulfiqar Ali Pathan	Animals Health Specialist
25	Dr. Muhammad Arif Khan	Fodder Specialist
26	Dr. Iqtadar Ali Memon	Marketing Specialist
27	Dr. Rukhsana Vighio	Training Specialist
28	Dr. Ali Akhtar Shahani	Animal Reproduction Specialist
29	Dr. Muhammad Naeem Siddiq Ansari	Animal Assets Specialist
30	Dr. Farzana Ayaz	Social Mobilization Specialist
31	Dr. Munaga Soomro	Gender Specialist

Attachment 6-2-2 Minutes of the Second Livestock Development Platform Meeting

Meeting Report

Type of Meeting	Second Annual Livestock Development Platform Meeting
Date /Time	3rd December 2015 10:30 to 17:30
Participants	List attached
Place	Indus Hotel, Hyderabad, Sindh
Meeting agenda	As per the program attached
Attachment	The programme of the meeting, The list of participants

1. Recitation from Holy Quran:

The meeting started with recitation verses from Quran by Dr. Muhammad Arif Khan, Counterpart for Fodder Development and production

2. Welcome address:

Dr. Ali Akbar Soomro, Director General Livestock Sindh/Project Coordinator welcomed the participants and appreciated that all the participants managed to spare time to grace the occasion. He said it is encouraging for the organizers that the participants travelled from long distances to support the livestock sector development in this Province. The object is to collaborate, compliment and coordinate the activities for livestock sector development.

He further emphasized that, the meeting is an opportunity for all of us to share many things to uplift the livestock farmers of Sindh.

The project is based on the outcome of the Master plan study carried out in 2010-13 by Japanese experts and local counterparts jointly. The purpose is to increase the dairy production of small farmers. The goal is to export our livestock products under "Sindh brand" to International markets for which everyone from us has to contribute. He said that participants input for the following points will be appreciated:

1. Betterment of the project
2. Role of every stakeholder
3. Coordination of the activities of all the stakeholders

He said that, he is sure the participants will guide us how to proceed further in a good way so that we all jointly support the Livestock Sector Development.

3. Keynote address:

Dr. S. Hirashima Senior Advisor, JICA delivered the keynote address through presentation on 'Direction of Sustainable Livestock Development in Sindh: Agricultural Growth with Productivity & Resource Enhancement, and Social Stability'. The following key concepts were discussed:

1. Growth strategy that does not contribute to the stability of society is counterproductive

2. The minimum growth rate of agriculture is 4% when the employment elasticity is 0.5.
3. Social stability can be better ensured by the diversification of income structure and asset holding position of the lower income households are improved
4. Asset holding is more crucial for lower income households as a hedge against risk and uncertainty

He informed the participants that the direction of the JICA's project is in consistent with the requirements of the overall development strategy.

4. Presentation on project features, and progress:

Mr. Hiroshi Okabe, Team leader (JICA Project Team) gave the presentation and explained the whole project activities progress and plan. To facilitate the constructive and positive discussion in the platform meeting, he especially requested the participants to keep their views and comments focused on the 3 points, i.e. 1) Betterment of the Project, 2) Your roles and responsibilities in the sector, and 3) For the coordination among all of us.

5. Highlights of livestock technology development 2015:

Dr. Hideo Tominaga and four groups of the counterparts of the project gave the presentation on their respective fields and explained the progress and results.

- **Group 1** (Farm management & Marketing) by Dr. Ghulam Muhammad Jiskani & Dr. Iqtadar Ali Memon
- **Group 2** (Feeding management & Fodder) by Dr. Safdar Ali Fazlani & Dr. Muhammad Arif
- **Group 3** (Genetics & Animal assets) Dr. Mubarak Jatoi with Mr. Ali Haider Shah (Matiari Breeder) & Dr. Naeem Ansari
- **Group 4** (Animal reproduction & Animal health) by Dr. Ali Akhtar Shahani & Dr. Zulfiqar Ali Pathan

Question & Answer Session

Following the presentations of the counterparts, questions and comments were shared from the participants.

1) Dr. Muhammad Afzal, Project Coordinator FAO (FMD, PPR) project Islamabad

- He commented the overall project activities were very good and appreciated the work done by the project.
- He suggested the use of local California Mastitis test kit available in Faisalabad applying simple detergent test, which is more cost effective and may be used to detect mastitis
- He inquired the cost of calf rearing in the first three months.
- Dr. Tominaga replied calf rearing in the first year was still on trial basis. That's why rearing costs were still high due to use of pure milk. But we have a plan to use alternative milk replacer or cow milk in next year to reduce rearing costs.
- Dr. Afzal said that Faisalabad and Lahore Universities were doing calf rearing experiments with very

reasonable costs and economical way. He suggested the project refer the results of such trials.

2) Dr. Shuabuddin Memon (Senior Chief, P&D Department)

- He said presentation of the CP was good, but if they start from object first, and result in the end that will be clearer for participants.

3) Dr. Khalil-ur-Rehman Shaikh (Additional Secretary, SGA&C Department)

- He mentioned that rural areas of the Pakistan are yet not developed and what will be the impact of the project on that area?
- He inquired how the milk selling price at pilot farms has increased from 40 to 60 Rupees?
- He asked if there is any provision of the by-products?
- How the local farmers approach to the laboratory in Karachi developed by the project?
- Why the project does not consider other animals like cow whose milk is healthier than those of buffalo?
- Dr. Ghulam Sarwar Shaikh, General Coordinator of the project responded that:
- Basically project is targeting small farmers to increase their income and assets so that rural Sindh may be developed.
- The pilot farmers were linked with Engro milk procurement network, and farmers started marketing milk jointly. That empowered farmers to negotiate the price hence they got good price.
- Soon the milk production of the pilot farmers will increase, the production of milk by-products will be considered by the farmers.
- The basic infrastructure of nutritional laboratory was available at Poultry Research Institute Karachi hence it was decided to strengthen this laboratory for the use of the project.
- Since the major milk production comes from buffalo population therefore buffalo was given priority.

4) Prof. M.N.M. Ibrahim (Country Representative, ILRI)

- He appreciated the activities and said International Livestock Research Institute (ILRI) is already working in 3 areas of Sindh i.e. Matiari, Khairpur and Tando Jam. They can collaborate and jointly carry out activity in these areas. He said that the role of breeders association is very significant for the project. He asked whether many abnormalities in male breed are due to genetic issues? Need to focus on the Red Sindhi cattle.
- Dr. Sarwar replied that main thirst of this meeting is to increase collaboration among stakeholders so the project will welcome the cooperation between two projects.
- He further informed that basic cause of abnormalities in males animals are due to poor genetics however we are still at early stage of work and will report further progress to this forum in next meeting.

5) Dr. Aslam Pervez Umrani (Director CVDL)

- He appreciated the activities of the project and working of counterpart staff. He mentioned difference between Badin buffalo breed and Matiari breed might have originated from the reason that land in

Matiari is fertile than Badin. In Badin animals has to walk long distance to get to pasture land and animals in Badin has limited sources of feed.

- What was the exact intervention to increase milk price from Rs 40 to Rs 60? Why not farmers sell milk in main cities like Hyderabad.
- Deformity variation of the testicles of bulls is due to disease?
- Dr. Sarwar replied we were collecting data from the breeders and making comparison of the Kundhi breed. Regarding milk price, we arranged workshops at pilot farms and working with Engro for establishing good marketing system.
- The research on abnormalities in buffalo bull is ongoing.

6) Mr. Younis Sandeela (CEO Farmwell)

- He said once project is over department should continue the calf center activities. He was of the view that private sector can work well than public sector in this regard. We have to develop the meat marketing sector there is no any meat supply system. He said middlemen also adulterate milk and get more profit than farmers.
- Dr. Sarwar suggested that calf rearing should be taken as potential business by the private sector and to support these investors the project will develop business model.
- We have the representation from Al Shaeer milk exporting company and will expect their input/support for meat marketing.

7) Dr. Noor Nisa Mari (Technical Officer, DG Office, Livestock Department)

- She appreciated overall progress of the project and congratulated the 2nd platform meeting. She suggested arranging seminars and workshops for the farmers.

6. Dissemination of technologies and methods to farmers – Future extension plan (by Ms. Mika Kawamoto and Dr. Rukhsana Vigio)

Ms. Mika Kawamoto delivered presentation on proposed extension activities. She explained about PRA activities at the pilot villages, extension training for staff (focal person/stock assistant), technical training materials and future plan of the extension activities.

7. Views of the participants;

Participants from different segment shared their views and comments on the presentations by the project team.

1) Dr. Muhammad Afzal (Project Coordinator, FAO)

- We extend our collaboration with JICA on technical aspect on behalf of FAO.
- Join hand together and work in project area
- Develop feed chart
- FAO is currently working on FMD and PPR disease control throughout Pakistan. We are happy to jointly work with JICA in Sindh.

2) Dr. Ibrahim (ILRI)

- JICA and Livestock department are doing lots of activities and we can join them in similar districts in Sindh
- We are willing to work with JICA and welcome at our office in Islamabad.
- In Punjab there are mobile services for farmers but there is no such service in Sindh. Why not having mobile service facilities for farmers in Sindh.

3) Dr. Ajaz Ahmed (ASLP)

- Calf rearing program is going very well.
- Introduce milk replacer or cow milk which is low cost than buffalo milk.
- Extension materials developed by ASLP can be utilized for farmers.

4) Professor Dr. Fatah Muhammad Soomro (Shaheed Benazeer Bhutto Veterinary University Sakrand, SBBVUS)

- Livestock information center should be established, University is ready to support this activity.
- PRA tools are best for dissemination of knowledge at grass root level.

5) Mr. Rafique Ahmed (SAFWCO)

- Our organization is ready to join hands with the project in field activities

6) Mr. Bakhshal Shah Bhukari (Engro Foods)

- He thanked for invitation to the meeting. Engro is already working in marketing component with JICA and in future Engro foods will fully cooperate with JICA.

7) Mr. Imran (Meat one company)

- Create awareness regarding meat marketing
- Company is supporting over 600 farmers in Badin
- We have already developed network in Punjab of four districts.

8) Dr. Noor Muhammad Soomro (Dean Faculty of AH &Vet. Science Tando Jam)

- Focus on the grass root level of farmers' activities.
- Experience and practices of the Punjab farmers can be utilized.

8. Next actions for livestock sector development in Sindh (facilitated by Dr. Ghulam Sarwar Shaikh)

Keeping in view the three points raised by Mr. Hiroshi Okabe, the suggestions on the project activities by the participants were invited:

Feedback from participants.

1-Betterment of the Project	2-Your role and responsibilities in the sector	3-For the Coordination among all of us
➢ Use of milk replacer in calf rearing ➢ Introduce Rhode grass at farmer level ➢ Farmers should keep record of their animals ➢ Selection of the good bull ➢ Control of animal migration ➢ Develop cow farming system in calf rearing ➢ In-house meeting of stakeholders to develop coordination and communication of all stakeholders ➢ Interaction among the organizations who are working in same activities in livestock sector ➢ Sindhi Translation of the presentation of Dr. Hirashima ➢ Involvement of Urban potential sector in calf rearing	➢ FMD Project will continue cooperation in animal disease control measures with the project ➢ Provision of competitive grant for scientist by Singh Agricultural Growth Project (Livestock) ➢ Collaboration and coordination in Sindh Level by ILRI	➢ Linkage of stakeholders at Sindh level and coordination ➢ Technical Advisory group for each area. ➢ Platform meeting every six month

9. Policy Remarks (by Mr. Noor Muhammad Leghari, Secretary Livestock)

The Secretary Livestock thanked all the participants for being in the meeting; he said as the department our role is to ensure smooth livestock production in a conducive environment where all the stakeholders can work jointly. The department has proposed regulatory framework for the livestock sector to the Provincial Assembly for approval. The implementation of regulations will help to export the livestock products.

After the 18th constitutional amendment Sindh has to develop Livestock Policy and the department is working on it, I have also requested JICA to support us in this task through continuous consultation and input.

He said a wonderful work is being done by JICA Project team and local counterpart staff in pilot districts; I really appreciate and assure that these activities will be continued even after the project life. The PC-IV will be submitted to the appropriate forum for the allocation of required funds to run the activities on sustainable basis.

He said the department is working in close coordination of JICA experts and livestock farmers and he is sure that project activities will be successful.

Dr. Ghulam Sarwar Shaikh thanked all the participants and mentioned today was very productive day. The project will try to move forward and request the cooperation from every stakeholders.

The meeting was adjourned.

Second Annual Livestock Development Platform Meeting

List of the Participants

December 3, 2015

Sr. #	Name of the Participants	Designations/ Organization
01	Mr. Shahab-ud-Din Memon	Senior Chief, Livestck & Fisheries, P&D Department Karachi
02	Dr. Khalil u Rehman	Additional Secretary (Regulations), SGA&C Department, Karachi
03	Mr. Abid Hussain Qureshi	Director Agricultural Extension, Agriculture Department, Hyderabad
04	Mr. Abdul Azeem	Director, Sindh Board of Investment, Karachi
05	Prof. Dr. Shigemochi HIRASHIMA	Senior Advisor, JICA Headquarters, Tokyo
06	Mr. Mitsuyoshi KAWASAKIi	Chief Representative, JICA Pakistan Office, Islamabad
07	Mr. Daisuke FUKUMORI	Deputy Director, South Asia Division 2, JICA Headquarters, Tokyo
08	Mr. Satoshi HAMANO	Representative, JICA Pakistan Office, Islamabad
09	Mr. Amir Bokhari	Senior Programme Officer, JICA Pakistan Office, Islamabad
10	Mr. Noor Muhammad Leghari	Secretary, Livestock & Fisheries Department Govt. of Sindh
11	Dr. Ali Akbar Soomro	Director General, Livestock & Fisheries Sindh/Project Coordinator
12	Dr. Aslam Pervez Umran	Director Veterinary Research & Diagnosis, Central Veterinary Diagnostic Laboratory (CVDL) Sindh, Tando Jam
13	Dr. Jamil Ahmed Shaikh	Director Animal Breeding, Sindh Livestock Department, Hyderabad/ JICA Project Manager
14	Dr. Tauseef Umer Farooqui	Director Poultry Production & Research, Sindh, Livestock Department, Karachi
15	Dr. Mushtaque Hussain Jokhio	Director Animal Husbandry Sindh, Livestock Department, Hyderabad
16	Dr. Sikandar Ali Panhwar	Project Director, Poultry Production Sindh, Phase-1, Hyderabad
17	Dr. Abdul Latif Memon	Deputy Director Livestock / Animal Husbandry, Hyderabad
18	Dr. Syed Riaz Ahmed Shah	Deputy Director Livestock / Animal Husbandry, Matiari
19	Dr. Mehmood Baloch	Deputy Director Livestock / Animal Husbandry, Tando Allahyar
20	Dr. Fida Hussain Memon	Deputy Director Livestock / Animal Husbandry, Tando Muhammad Khan
21	Dr. Kirshan Lal	Deputy Director Livestock / Animal Husbandry, Badin
22	Dr. Noorunisa Mari	Technical Officer, Director General Office, Livestock Department, Hyderabad
23	Dr. Noor Muhammad Soomro	Dean, Faculty of Animal Husbandry & Veterinary Sciences Sindh Agriculture University, Tando Jam
24	Prof. Dr. Fateh Muhammad Soomro	Shaheed Benazir Bhutto University of Veterinary Sciences, Sakrand
25	Mr. Syed Bukshal Shah Bukhari	Area Manager, Engro Foods Ltd. Tando Muhammad Khan Area Office
26	Mr. Uziar Ahmed	Small and Medium Enterprise Development Authority (SMEDA), Lahore
27	Mr. Rafique Ahmed	Sindh Agricultural and Forestry Workers Coordinating Organization

Sr. #	Name of the Participants	Designations/ Organization
		(SAFWCO), Hyderabad
28	Dr. Sobia Majeed	Area Advisor (Female), ASLP Dairy Project, Hyderabad
29	Dr. Muhammad Aejaz Kumbher,	Area Advisor (Male), ASLP Dairy Project, Hyderabad
30	Dr. Muhammad Afzal	Project Coordinator, FAO, (FMD, PPR) Project, Islamabad
31	Dr. Nasarullah Panhwar	Provincial Coordinator, FAO (FMD, PPR) Project, Karachi
32	Prof. M.N.M. Ibrahim	Country Representative, International Livestock Research Institute (ILRI), Islamabad
33	Mr. Zeeshan Mustafa	Livestock Economist, ILRI Pakistan Office, Islamabad
34	Dr. Nazeer Hussain Kalhoro	Project Director, Sindh Agriculture Growth Project (Livestock)
35	Mr. Rehan Saeed	J. B. Saeed Cattle Farm, Karachi
36	Syed Ali Hyder Shah	General Secretary, Matiari Breeders Association
37	Mr. Ashfaq Ahmed Shaikh	Progressive Animal Breeder, Matiari
38	Barrister Pir Mujeeb-ul-Haq	Progressive Dairy Farmer, Dadu
39	Dr. Lutf Talpur	Breeder, Tando Muhammad Khan
40	Mr. Younus Sandeela	CEO, Farmwell Pvt., Karachi
41	Mr. Abdul Latif Qureshi	Livestock Trade Association Sindh
42	Mr. Hiroshi Okabe	JICA Project Expert (Team Leader / Institutional Development)
43	Dr. Hideo Tominaga	JICA Project Expert (Livestock Technology Development)
44	Ms. Fumiko Ikegaya	JICA Project Expert (Deputy Team Leader / Marketing)
45	Ms. Noriko Hara	JICA Project Expert (Livestock Technology Development / Coordination)
46	Ms. Mika Kawamoto	JICA Project Expert (Livestock Extension Services / Gender)
47	Dr. Kazuhiro Ono	JICA Project Expert (Animal Health / Animal Reproduction)
48	Dr. Yukio Ikeda	JICA Project Expert (Livestock Business Management)
49	Dr. Teruo Sugiwaka	JICA Project Expert (Livestock Feeding Management)
50	Mr. Yoshio Chiba	JICA Project Expert (Genetic Improvement)
51	Mr. Teruo Kawamura	JICA Project Expert (Genetic Improvement)
52	Mr. Kodai Yugeta	JICA Project Expert (Training Management)
53	Dr. Ghulam Sarwar Shaikh	JICA Project General Coordinator
54	Dr. Rasool Bux Soomro	JICA Project Technical Coordinator
55	Dr. Ghulam Muhammad Jiskani	JICA Project Specialist (Farm Management)
56	Dr. Muhammad Mubarak Jatoi	JICA Project Specialist (Livestock Genetic Improvement)
57	Dr. Ali Akhtar Shahani	JICA Project Specialist (Livestock Reproduction)
58	Dr. Muhammad Arif Khan	JICA Project Specialist (Fodder Development & Production)
59	Dr. Iqtadar Ali Memon	JICA Project Specialist (Marketing)
60	Dr. Rukhsana Vighio	JICA Project Specialist (Training)
61	Dr. Naeem Siddique Ansari	JICA Project Specialist (Livestock Asset Development)

Sr. #	Name of the Participants	Designations/ Organization
62	Dr. Safdar Ali Fazlani	JICA Project Specialist (Feeding Management)
63	Dr. Zulfiqar Ali Pathan	JICA Project Specialist (Animal Health)
64	Mr. Asim Shaikh	JICA Project Office Secretary
65	Ms. Zahida Soomro	JICA Project Data Entry Assistant

The Project on Sustainable Livestock Development for Rural Sindh

AGENDA

Second Annual Meeting of
Livestock Development Platform
Thursday, December 03, 2015
Indus Hotel, Hyderabad

The major stakeholders of the livestock sector in Sindh are invited to this livestock development platform meeting.

The main purpose of this meeting is to facilitate the discussion among the stakeholders on the directions of the livestock sector development in Sindh and the roles and responsibilities that each of them is expected to carry.

In particular, the Secretary Livestock has now a plan to establish a livestock development policy for Sindh. This meeting is expected to have certain implication for this policy making.

For that purpose, after the presentation by the project team on the project plan and progress, we would like to ask the participants for the feedbacks particularly on the follow points:

1. Your views on how the project could contribute more on the livestock sector development in Sindh
2. What roles and responsibilities you can carry for the development of the livestock sector
3. How practically you or your organization and the Project can be coordinated

At the end of the meeting, we expect that the participants have a consensus on the next actions necessary for the establishment of the policy for the livestock sector development in Sindh.

The Project on Sustainable Livestock Development for Rural Sindh

PROGRAMME

Second Annual Meeting of
Livestock Development Platform
Thursday, December 03, 2015
Indus Hotel, Hyderabad

Time	Activities	Resource person
10:00	Guests to be seated	Project Staff
10:00	Recitation from Holy Quran	Dr. Muhammad Arif Khan
10:05	Welcome address	Dr. Ali Akbar Soomro, Project Coordinator
10:10	Keynote address	Dr. Shigemochi Hirashima
10:40	Presentation on Project features, and progress	Mr. Hiroshi Okabe, Team leader of JICA project team
11.10	**Tea break**	
11:30	Highlights of livestock technology development 2015	Dr. Hideo Tominaga and Counterparts
12:10	Question & Answers	Facilitated by Dr. Ghulam Sarwar Shaikh and Project Counterparts
12:40	**Lunch & Prayer break**	
13:40	Dissemination of technologies and methods to farmers – Future extension plan	Ms. Mika Kawamoto/Dr. Rukhsana Vighio
14:10	Views of the participants: University NGOs Private Sector (marketing) Donor Projects Progressive Farmers Livestock holders in Cattle colony /Farmer	Representation from each segment appreciated
15.00	**Tea break**	
15:20	Next actions for livestock sector development in Sindh	Facilitated by Dr. Ghulam Sarwar Shaikh
15:50	Policy remarks	Mr. Noor Muhammad Leghari, Secretary Livestock & Fisheries Department Govt. of Sindh
16:00	Vote of thanks	Dr. Jamil Ahmed Shaikh, Project Manager
16:00	**Evening tea**	

Attachment 6-2-3 Minutes of the Consultation Meeting (January 2016)

Meeting Log

Title	Consultation Meeting for Project Management Training (2nd Year and 3rd Year)
Date/Time	21 January 2016, 11:00-12:00
Place	Breeding Room, Livestock Department, Hyderabad
Participants	Dr. Jamil Ahmed Shaikh (Director Animal Breeding / Project Manager) Dr. Abdul Qadir Junejo (Director Planning & Monitoring) (Attended only the last part of the meeting) Dr. Mushtaque Hussain Jokhio (Director Animal Husbandry) Dr. Noor-un-Nisa Mari (Focal Person, Project Management Taskforce) Mr. Hiroshi Okabe (Team Leader) Dr. Ghulam Sarwar Shaikh (General Coordinator) Mr. Kodai Yugeta, Dr. Rasool Bux Soomro, Mr. Muhammud Ibhahim Shaikh
Agenda	To review the 2nd year's Project Management Training and discuss the 3rd year's Training
Actions	-
Attachment	-

The following describes main topics that were discussed during the meeting.

1. Implementation Structure for Next Year's Training

- Discussed on the idea of establishing a secretariat suggested by JICA Team.
  - Mr. Okabe: We need to have a Project Management secretariat in the Department, and that should be authorized by the Department. For the sustainability of the training activity, I'd transfer some responsibilities on the implementation of trainings to the secretariat although JICA Team still takes responsibility over the contents and the quality of the trainings.
  - We should also establish a system in the Department where participants can report the progress and the result of their Next Actions after the training. Follow-up including monitoring of the training participants should be done by the secretariat.
  - Dr. Jokhio: Trainings were very useful for us. Now it's our time to consider how to utilize these participants in our daily work. Our officers are good in field but they lack non-technical, especially reporting ability. I agree with the idea.
  - Dr. Sarwar: I suggest that the secretariat be established within the DG office. It should work as a contact point with outside of as well as within the Department. The information related to the participants are to be kept at the secretariat. Then, they should initiate implementation of trainings even after the Project's termination.
- The idea was further discussed and accepted by the Directors.

2. Training for Master Trainers

- Discussed on the idea of developing master trainers suggested by JICA Team.

- Mr. Okabe: I'd like to develop mater trainers for each key subject related to project management. They should be core persons within the Department. Major topics should be picked up for the training.
- Dr. Jamil: Good idea. We should select four or five people from the past or coming training participants.
- Dr. Jokhio: We have to polish the participants. They are now encouraged to deliver the learnings. We have to teach them how to apply these learnings.
- Dr. Noor: Good idea. We select from young officers. Outsiders can show us only examples from outside of the Department. If we train master trainers, they can show us examples of how the subjects are to be delivered within our Department.
- Dr. Sarwar: Devolution is needed. We should invite more people including the deputy directors from the Districts.

- The idea was accepted by the Directors.

3. Targets for Next Year's Training

- Mr. Okabe explained the targets for next year's Output 4 such as the development of SOPs and the organization of a platform meeting.
- One of the major targets for next year's training is to establish a reporting system within the Department, where the result of projects is reported on time in the forms of monthly or annual reports.
  - Dr. Jokiho: We have to write annual reports, but actually for 15 years we did not have such practice. We need to start it again.
  - Dr. Noor: So we can start the practice following the current institutional setup.
- The idea of the next year training was accepted by the Directors.

Attachment 6-3-1 Minutes of the Consultation Meeting (March 2016)

Meeting Log

Title	Consultation Meeting on the Commencement of the Third Year
Date/Time	31 March 2016, 10:10-12:40
Place	Breeding Room, Livestock Department, Hyderabad
Participants	Dr. Aslam Pervez Umrani (Director Veterinary Research and Diagnosis) Dr. Abdul Qadir Junejo (Director Planning & Monitoring) Dr. Mushtaque Hussain Jokhio (Director Animal Husbandry) Dr. Noor, Dr. Zulfiqar Ali Bhuto (DG), Dr. Muzafer (Breeding) Mr. Okabe, Dr. Ghulam, Dr. Soomro, Mr. Yugeta (Project Team)
Agenda	To explain the 3rd year's activities and mid-term evaluation To propose the establishment of the Training Secretariat
Actions	Highlighted in yellow color.
Attachment	-

The following describes main topics that were discussed during the meeting.

1. Main Activities of the Third Year

- Mr. Okabe introduced the main project activities planned for the 3rd year.

- Dr. Aslam: Climate change is now an important issue to be tackled as is mentioned in the Sustainable Development Goals. Some areas in livestock are related, for example, farmers have to adapt themselves to climate change and mitigate emission of gases. Trainings on this issue should be provided.
  - Mr. Okabe: We can't focus only on specific issues because that is not our mandate. But we are providing a training on PC-1 preparation, where you can learn how to make a strategy to tackle these issues. We can incorporate such a specific case study into the training.
- Dr. Muzafer: The Project is developing C/P's capacity in technical side. But how do you plan to develop non-technical capacity without having C/P?
  - Mr. Okabe: You Taskforce members are the ones whose capacity we wish to develop for non-technical side. Although we cannot call you officially as C/P due to our Project agreement, there is no difference between you and our technical C/Ps
  - Dr. Sarwar: We give a certificate of completion to training participants who pass a post-test after each training. That is how we increase the number of officers having non-technical capacity.
- Dr. Jokiho: Extension activity in other Districts is good. It should be more publicized. When you visit project sites, you'd better visit the Deputy Director's office and chat with them for better coordination.

2. JICA's Mid-Term Review

- Mr. Okabe briefly explained the points to be shared about JICA's Mid-Term Review.

- Dr. Aslam: How many people are coming from Japan? How many people are needed from Sindh side? In which language will a report be given?
  - Mr. Okabe: Usually 2 to 3 people from JICA HQ plus 1 consultant joins from Japanese side and 3 members (probably Directors) are required from Sindh side. The review will be done in English and the report will be published in English.
- Dr. Aslam: The revised PC1 should be submitted after you get suggestions from Mid-Term Review.

3. Proposal related to Output 4

- Dr. Noor presented the suggestions from Project Management Taskforce on 1. TOR of the Training Secretariat, 2. themes for the 3rd year's training and 3. themes for master trainer's trainings based on the discussion in the meeting on 30 Mar.

(Regarding TOR of the Training Secretariat)

- Secretariat should be renamed as "Capacity Building Unit" because the word is confusing and be established under Directorate Planning, whose function needs to be strengthened.

(Regarding themes for the 3rd year's training)

- Dr. Aslam: Training on computer literacy (Word, Excel, PowerPoint) is required because this is something essential for other major trainings like PC1 writing and Project Planning. Participants should be junior officers from each Directorate who are already accustomed to the use of computers.
  - This computer training can be provided by other institute.
- Dr. Aslam: Training on procurement and purchase is important. Target groups will be Deputy Directors and research officers.
  - Dr. Junejo: I know other institutes that can provide a good training on this topic.
- Dr. Aslam: Last year SOP training did not go very well with heavy assignments. Who should get this training? Candidates should be those who actually prepares SOPs.
  - Mr. Okabe: We shall have selection criteria for each topic.
- 5 topics recommended by Directors are: PC1 writing, Report writing, Data management, Computer literacy, Procurement and purchase. Other topics can be done in coming years.
  - Mr. Okabe: Within our budget, we will choose some of the topics although our focus is on reporting structure and SOP development. This year we will invite our C/P and more District officers as well.

(Regarding themes for trainings for master trainers)

- Dr. Aslam: PC1 writing is concerned with very few officers who actually engages in its preparation. This is something you learn by doing. You should first develop competent writers. If you implement, 6 to 8 participants are enough. You'd better cover a specific topic on the first day and prepare a PC1 for that topic for the rest of the period.
- Dr. Jokiho: Training on communication skill is important.

Attachment 6-3-2 Minutes of the Third Steering Committee Meeting

Minutes of Meeting

Title	3rd Steering Committee Meeting
Date/Time	26 May 2016, 11:10-14:40
Place	Pearl Hall, Indus Hotel, Hyderabad
Participants	See the participant list
Agenda	To share the progress, plans and opinions about the Project among related persons
Actions	NIL
Attachment	NIL

The following describes main topics that were discussed during the meeting.

- **11:10-15 Recitation from Holy Quran (by Dr. Arif, C/P Fodder)**

- **11:15-20 Self-Introduction of the Participants**

- **11:25-28 Welcome Address (by Dr. Jamil, Project Manager)**
  - The role of the Steering Committee is very important in providing guidance to the project to carry out activities, and we believe that this process of sharing will help us to make the Project successful.
  - The main thrust of the Project is to promote agriculture growth with high employment elasticity, to reduce inter-regional as well as intra-regional disparities, and to alleviate poverty.
  - As results of our four outputs, the Project is expected to build up the development foundation of livestock technology, human resources and institution in the pilot Districts.

- **11:28-33 View of the JICA Pakistan Office for the Project (by Mr. Tojo, Chief Representative JICA Pakistan Office)**
  - This Project is important in light of JICA's cooperation policy in a sense that it aims at asset creation and income source diversification of poor farmers so that they can control and mitigate their risks.
  - We have a mid-term review in August but JICA has a concern about the delay of several actions to be taken by the Sindh Government, e.g. recruitment of staff, provision of vehicles and payment of project allowance to C/P. JICA requests the Sindh Government to promptly solve these issues by the time of the mid-term review. Otherwise we might have to revise the project scope.
  - Sustainability of the Project should be secured even after the Project termination by continuous recruitment of project staff under PC4 budget and some other measures.

- **11:33-12:22/12:40-12:55 Overall Project Progress, Plan for the 3rd Year and Issues (including Q&A) (by Mr. Okabe, Team Leader)**
  - Mr. Okabe introduced the Project progress, plans for the 3rd year, and remaining issues.
  - (Dr. Umrani) 1. The cost of the Project's calf salvation model is still high to be operated sustainably and

cover wider areas of Sindh. In developed countries, calf raising is a separate industry with an economical model. The Project needs to develop such an enterprise model for its sustainability. 2. PC1 is better to be revised after mid-term review.

- ✧ (Dr. Tominaga) 1. By the end of this year, the Project will contact NGOs and other institutions for the continuation of the activity. So the Project intends to develop multiple models that can be utilized by them.
- ✧ (Mr. Okabe) 2. Right. We started this discussion already a year ago, and the issue is still within the Department. Now the mid-term review comes soon, so we shall discuss about the timing of revision whether it should be done after the review, but we always have to keep in mind that the process takes so much time.

➢ (Dr. Junejo) Coordination between JICA Team and the Department at a District level should be improved for dissemination of technologies.

- ✧ (Mr. Okabe) As explained in my presentation, the Project plans to officially nominate District Deputy Directors as our "Project District Coordinators", to promote more active involvement of them and to invite them to our trainings.

- **12:55-14:00 Detail Plan, Progress, and Issues for Livestock Technology Development (by Project C/Ps)**
  - ➢ The Project counterparts explained about livestock technology development activities in each field.
    - ✧ (Group 1) Dr. Jiskani / Dr. Iqtadar (Farm Management / Marketing)
    - ✧ (Group 2) Dr. Arif / Dr. Safdar / Dr. Naeem (Fodder / Feeding / Livestock Assets)
    - ✧ (Group 3) Dr. Zulfiqar / Dr. Shahani / Dr. Jatoi (Animal Health / Reproduction / Genetics)

- **14:00-14:08 Detail Plan, Progress, and Issues for Technology Dissemination (by Dr. Rukhsana)**
  - ➢ Dr. Rukhsana explained about the progress and issues of extension activities.

- **14:08-14:35 Open Discussion (facilitated by Dr. Sarwar, General Coordinator)**
  - ➢ (Dr. Umrani) 1. We Directors want to listen to Project technical activities more frequently on quarterly basis, somehow by forming Technical Working Group. 2. Economic analysis should be done without including labor cost because the opportunity cost is zero in rural areas. 3. The Project should survey not only the market but also the production side such as cooperatives and farmer groups to increase the milk selling price. 4. Now cotton seed cake tends to be toxic. It's better to be checked or other alternate ingredient like palm seed cake which is good nutrient value and reasonable cost. 5. Better to check other shops for the fodder with better quality because it can change across seasons. 6. DNAs of pure bulls should be profiled. 7. Sub-clinical mastitis awareness also should be taken into consideration, which even technicians do not know.
    - ✧ The idea of quarterly "Technical Working Group" is approved by the participants.
  - ➢ (Dr. Junejo) 1. In Punjab fodder was distributed to farmers when a disaster occurred. The Sindh should follow the same way. 2. Calf salvation expenditure is high compared to the real value of milk. 3. Artificial insemination services should be provided to prevent the spread of diseases.
  - ➢ (Dr. Jokhio) The Project should focus on the following important areas of long calving interval, poor

fertility rate, hygienic condition of milk production and identification of bulls that can transmit good abilities. And project management is a basis to cover all these areas.

- ✧ The above suggestions and questions will be further discussed in the "Technical Working Group".

- ➢ (Dr. Ali Jan) We, the temporary extension team, would like to request the Department to utilize our skills developed during the Project activities for other projects even after dissolution of the temporary team.

- **14:35-14:40 Closing Remarks (by Dr. Soomro, Director General/Project Coordinator)**
  - ➢ DG Livestock appreciated the success of today's Meeting and left his words that new staff would start working in the next week, the recruitment process of a new Project Manager would be completed by the end of June, and remaining vehicles would be allocated very soon.

- **The meeting was closed at 14:40.**

S#	Name of Participants	Designation/Expertise
1	Dr. Ali Akbar Soomro	D.G Livestock / Project Coordinator
2	Mr. Yasuhiro Tojo	Chief Reprehensive JICA Pakistan Office
3	Mr. Satoshi Hamano	Representative JICA Pakistan Office
4	Dr. Jameel Ahmed Shaikh	Project Manager / Director Breeding
5	Dr. Aslam Parvez Umrani	Director Veterinary Research CVDL, Tando Jam
6	Dr. Mushtaq Hussain Jokhio	Director Animal Husbandry Hyderabad
7	Dr. Abdul Qadir Junejo	Director Animal Planning Sindh
8	Mr. Abid Hussain Quershi	Director Agri:Farms & Group Development
9	Dr. Riaz Ahmed Shah	Deputy Director Matiari
10	Dr. Noor-un-Nisa Mari	Technical Officer D.G Office
11	Mr. Hiroshi Okabe	Team Leader / Institutional Development
12	Dr. Hideo Tominaga	Livestock Technology Expert
13	Ms. Noriko Hara	Assistant to Livestock Technology
14	Mr. Kodai Yugeta	Training Expert
15	Ms. Mika Kawamoto	Extension / Gender Specialist
16	Dr. Takehi Abe	Animal Reproduction Expert
17	Dr. Ghulam Sarwar Shaikh	General Coordinator
18	Dr. Rasool Bux Soomro	Technical Coordinator
19	Dr. Safdar Ali Fazlani	Feeding Management Specialist
20	Dr. Mubarak Jatoi	Livestock Genetics Specialist
21	Dr. Ghullam Muhammad Jiskani	Farm Management Specialist
22	Dr. Zulfiqar Pathan	Animals Health Specialist
23	Dr. Muhammad Arif	Fodder Specialist
24	Dr. Iqtadar Ali Memon	Marketing Specialist
25	Dr. Rukhsana Vighio	Training Specialist
26	Dr. Ali Akhtar Shahani	Animal Reproduction Specialist
27	Dr. Naeem Siddique Ansari	Animals Assets Specialist
28	Mr. Asim Shaikh	Assistant JICA Project Team
29	Ms. Zahida Soomro	Computer Operator JICA Project Team
30	Dr. Mohammad Ibrahim Shaikh	Project Manager Assistant
31	Dr. Dodo Chandio	Focal Person JICA Badin
32	Dr. Mohammad Rahim	Focal Person JICA TMK
33	Dr. Maqsood Ahmed Memon	Focal Person JICA Tando Allahayar
35	Dr. Ali Jan	Focal Person JICA Hyderabad
36	Mr. Dilsher Leghari	Extension Worker Matiari
37	Mr. Fatah Mohammad	Extension Worker Badin
38	Mr. Mohan Lal	Extension Worker Hyderabad

Attachment 6-3-3 Minutes of the Special Steering Committee Meeting

Minutes of Meeting

Title	Special Steering Committee Meeting
Date / Time	17 August 2016, 15:20-18:25
Place	Diamond Hall, Indus Hotel, Hyderabad
Participants	See the attached Participant List
Agenda	To share the findings and the recommendations of Mid Term Review Team
Actions	As indicated
Attachment	-

The following describes main topics that had been discussed during the meeting.

1. Recitation from Holy Quran (by Dr. Arif, C/P Fodder) [15:20-15:25]

2. Introduction of the Participants [15:25-30]

3. Welcome Address (by Dr. Aslam, DG Extension & Research) [15:30-35]

- Dr. Aslam welcomed the participants and appreciated the efforts of MTR Team.

4. Reports on Findings at Mid Term Review Survey (by Dr. Kanameda, MTR Team Leader) [15:35-55]

- The MTR Team reported the findings of MTR Study. The following describes a summary of their report.
- Accomplishment of the Project:
  - Project Purpose: Moderately Low
  - Indicator 1: Low
  - Indicator 2: Moderate
  - Indicator 3: Moderate
  - Indicator 4: Highly likely to be achieved
  - Indicator 5: Low
  - Output 1: Moderately High
  - Output 2: Moderate
  - Output 3 Low
  - Output 4: Moderately Low
- Evaluation Results by DAC Criteria:
  - Relevance: Very High
  - Effectiveness: Moderate
  - Efficiency: Moderately Low
  - Impact: Moderately Low
  - Sustainability: Moderately Low

5. Recommendations of Mid-Term Review Study [15:55-16:05]

- The MTR Team made recommendations on necessary measures to be taken by the Project Team, the Livestock Department, the Sindh Government and JICA, respectively for the betterment of the Project activities for its remaining second half. Each item is described in the following section.

6. Signature on MTR Report (by Dr. Kanameda and Dr. Aslam) [16:05-10]

- The MTR Team Leaders both from Japanese and Pakistan sides signed on the Mid-Term Review Report.

7. Q&A and Clarification/Finalization of Measures for Recommendations [16:30-18:10]

- The participants discussed on each recommendation from the MTR Team and necessary measures to be taken by responsible parties.

A. Necessary Measures to be taken by the Project

(1) Input for supporting Breeder's Association should be optimized. [#1 in MTR Report]

- (Mr. Okabe / JICA Project Team Leader) The Project will only focus on milk production test and pedigree registration. Establishment of the association shall be excluded from the Project activities.

(2) Method of utilization of buffalo calf and dry buffalo should be made economically viable for the target group. [#2 in MTR Report]

- (Dr. Aslam / DG Extension) The price of heifer reared at the calf center is much higher than the market price, so the rearing cost should be minimized. Besides, the indicators of calf salvation and dry buffalo salvation are currently combined into one OVI, thus it should be separated.
- (Dr. Tominaga /JICA Expert) What we do at the calf center is rather for data collection than business, so the cost tends to be high. We will indicate multiple options for feasible calf salvation system by the end of this year, after we start giving technical guidance to the organizations interested in this activity. Dry buffalo salvation activities have just started, and we will develop a guideline by the end of the 4th year.
- (Dr. Junejo / Director Planning) My idea is different as this activity is for reproducing high yielding buffaloes for the future benefit and not for just short-term benefit. So the rearing cost is not an issue.
- (Mr. Bukhari / JICA Pakistan) The purpose of this activity is to preserve the high yielding Khundi buffalo. Majority buffalo calves used to be sent to slaughterhouse. The success of this activity should be evaluated from the view point of productivity of the salvaged buffalo calves and the decrease in its mortality rate.

(3) Existing technical staff and para-technical staff in the Pilot Districts should be incorporated within the present activities for securing sustainability. Focal Persons also should be continuously engaged in the Project. The Project should consider pilot farmers as possible facilitators for farmer-to-farmer knowledge-dissemination. [#3 in MTR Report]

- (Dr. Aslam) Appropriate technologies like how to raise animals properly is beneficial for the farmers, and therefore it should be included in current duties of the Departmental officers and staff such as treatment and artificial insemination. The Department has no objection to give such trainings to the officers.
- (Mr. Ramzan / Secretary) I agree that such special trainings are required.
- (Mr. Okabe) The idea is acceptable but we first need to make sure that they fully understand appropriate technologies and way to disseminate them to the farmers if involved in the project activity.

- (Dr. Aslam) My request is not to consider them as the project staff, but rather to enable them to deliver useful message to the farmers while conducting their routine work in the field.
- (Dr. Junejo) Technical trainings rather than non-technical trainings should be considered.
- (Secretary) The number of officers working in the target Districts will be increased. We are now planning to hire 29 additional officers who can be allocated to the pilot districts, and the current Focal Persons will be continuously working for the project even after February 2017.

- (Mr, Okabe) Regarding possible facilitators for farmer-to-farmer dissemination, we assume that 1 farmer in a village can disseminate the technologies to 5 surrounding farmers. But not only P/Fs but also other core farmers can do so.
- (Dr. Aslam) The MTR Team has found successful stories of some P/Fs. The Project should share these experiences to other farmers. They should be encouraged to become a demonstration unit to train other farmers, but they have to be paid with some incentives.

(4) The effective strategy of human resource development plan should be prepared. Training opportunities should be allocated to the appropriate number of people in appropriate positions. The follow-up activities after the trainings should be considered. [#4 in MTR Report]

- (Mr. Okabe) We have established Capacity Building Unit (CBU) within the Department, which is expected to serve as a permanent unit. A human resource development plan can be prepared by CBU in collaboration with the project. but the budget for training on human resource development needs to be covered also by the Government side (under PC-1).
- (Dr. Junejo) I expect CBU to arrange both non-technical and technical trainings.
- (Secretary) We will take these trainings into permanent basis if they are proven to be beneficial.

(5) Coordination between Output 1 and Output 3 should be improved. [#5 in MTR Report]

- (Mr. Suzuki) The MTR Team has found that there is a gap between Appropriate Technology Checklist prepared by technology development team of the project and Extension Plan prepared by extension team. They need more collaboration each other.
- (Dr. Aslam) The large number of C/Ps has worked so far since the beginning of the Project for technology development, while extension team has been just recruited. Verified technologies should be shared between them via developed guidelines.
- (Mr. Okabe) Various guidelines will be developed by both sides, and through this activity we will have more coordination.

(6) The current PDM (version 2) should be revised based on the suggestions made by the MTR Team. [#7 in MTR Report]

- (Mr. Suzuki) The MTR Team included our idea on the revised PDM in our report. The main point is that we changed some indicators to fit the current Project activity.
- (Mr. Okabe) I'd like to suggest to hold a Special Steering Committee in January 2017, where we will discuss the revised PDM ver.3 The participants accepted the idea.

B. Necessary Measures to be taken by Livestock Department, Sindh

(7) For the Department: Supporting system for PM till full-time PM is recruited should be strengthened. [#8 in MTR Report]

- (Secretary) We have assigned the supporting staff to the PM.
- (Mr. Okabe) Based on the fact that we have faced serious delay on some aspects, not only the supporting staff but also guidance from DGs and the other Directors to PM is very welcomed and needed.

(8) The mechanism of PC-1 budget release should be shared with the Project execution team both sides for follow up. [#9 in MTR Report]

- (Secretary) I would request PM to share information with JICA Team and JICA Team to share information with us. Information should regularly flow between us.
- (Mr, Shahabudin / Senior Chief of P&D Department) The P&D Department has always tried to share the information, but JICA Team has never provided us information.
- (Mr. Okabe) We have been always providing information from our side to PM as per his request.
- (Mr. Imamura) Is it a rule that any projects supported by donor countries should also share information with the Sindh government? If so, we will follow it.
- (Mr. Shahabudin) Other donor agencies share information. JICA must follow them.
- (Mr. Bukhari) This Project is not on loan basis like other agencies' projects. But if you request JICA HQ can give you information because they deal with the budget.
- (Mr. Okabe) We, as a consultant firm, will share such information instead of JICA if JICA has no objection on this.

(9) Incumbent technical and para-technical staff should be given the opportunity to learn Project outcomes. [#10 in MTR Report]

- Already discussed.

(10) Rapid actions for making PRI sustainably operational and effective use of laboratory equipment procured by JICA in mini-laboratory as well as in PRI should be planned and implemented. [#11 in MTR Report]

- (Mr. Abid / PRI) There is a lack of staff at PRI. Kindly request more staff allocation.
- (Secretary) I would request PRI to submit proposal on what facilities and staff are needed. We will take it serious and may allocate suitable resources.
- (Dr. Aslam) CVDL officers should be given trainings at the Project's mini-laboratory because they will be the ones who sustain the Project's knowledges after its termination.

C. Necessary Measures to be taken by Sindh Government

(11) Earlier settlement of the delayed issues on purchase of vehicles and motorbikes, recruitment of 10 female extension workers, and revision of PC-1 which includes recruitment of full-time PM and Project

allowances to counterpart staff. [#12 in MTR Report]

- (Secretary) Tomorrow we will make sure with the P&D Department on these issues. Suggestions from MTR Team should be taken into consideration in the revised PC-1.
- (Mr. Okabe) We, with the Livestock Department, will work hard to prepare the draft of revised PC-1 and sent it to the Secretary Livestock within this month. It is requested to the Secretary Livestock that such draft be sent to P&D Department by the 1st week of September.

(12) Continuous support for assignment of human resources, provision of budget and equipment by PC-1 and by PC-4 in the future (after the Project). [#13 in MTR Report]

- Already discussed.

D. Necessary Measures to be taken by JICA

(13) JICA budget for the 4th year project activity should be carefully examined in proportion to the counterpart fund of Sindh Government. The progress of PC-1 release and input from Livestock Department should be confirmed not later than February 2017 for JICA's action. [#15 in MTR Report]

- (Mr. Imamura) JICA strongly expects necessary actions be taken in time because all participants have confirmed strong commitment of the representative from P&D Department as well as the Secretary.
- (P&D) That depends on the progress of PC-1 revision.
- (Mr. Imamura) I dare not say anything here but it will end up with "JICA's action" if only little progress is confirmed before the stated deadline.

8. Signature on Meeting Minutes [18:10-18:15]

- The Secretary Livestock and Dr. Kanameda signed on the Meeting Minutes.

9. Closing Remarks (by Mr. Ramzan, Secretary Livestock) [18:15-20]

- Mr. Ramzan, Secretary left his closing remarks that:

  Our current expenditure is one third to the expected one for the past three years. We need to improve our deficiency by completing the tasks of recruitment of full-time PM and female workers and purchase of vehicles. I would request PM and DGs to remove all the deficiency to improve the things. This Project activity should be definitely continued to make our officers capable to disseminate information to the farmers. It is our responsibility to incorporate good practice for increase of milk production. Together we will make this Project success.

Participant List

#	Name of Participants	Designation/Expertise
1	Mr. Muhammad Ramzan Awan	Secretary Livestock
2	Mr. Shahabudin Memon	Senior Chief (Livestock), P&D Department
3	Dr. Masaharu Kanameda	MTR Team Leader (Japan) JICA HQ
4	Mr. Makoto Imamura	MTR Team Member JICA HQ
5	Mr. Atsushi Suzuki	MTR Team Member JICA Consultant
6	Mr. Amir A. Bukhari	Senior Officer JICA Pakistan Office
7	Dr. Aslam Parvez Umrani	DG Extension&Research / MTR Team Leader (Pakistan)
8	Dr. Abdul Qadir Junejo	Director Planning Monitoring / MTR Team Member
9	Dr. Jameel Ahmed Shaikh	Project Manager JICA Team / Director Animal Breeding
10	Dr. Mushtaq Hussain Jokhio	Director Animal Husbandry
11	Dr. Mehmood Baloch	Deputy Director Tando Allahyar
12	Dr. Abid Hussain Quershi	Deputy Director Tando Muhammad Khan
13	Dr. Abdul Latif Memon	Deputy Director Hyderabad
14	Dr. Kirshan	Deputy Director Badin
15	Dr. Riaz Ahmed Shah	Deputy Director Matiari
16	Dr. Noor-un-Nisa Mari	Technical Officer DG Office
17	Mr. Abid Hussain Lakhiar	Account Officer PRI
18	Ms. Yukari Maeda	MTR Team Assistant / JICA HQ
19	Mr. Hiroshi Okabe	Team Leader / Institutional Development Expert
20	Dr. Hideo Tominaga	Appropriate Technology Development 1 Expert
21	Ms. Noriko Hara	Appropriate Technology Development 2 Expert
22	Mr. Kodai Yugeta	Training Management Expert
23	Ms. Mika Kawamoto	Extension / Gender Expert
24	Dr. Shinsuke Kobayashi	Fodder Expert
25	Dr. Ghulam Sarwar Shaikh	General Coordinator JICA Team
26	Dr. Ghullam Muhammad Jiskani	Farm Management Specialist
27	Dr. Safdar Ali Fazlani	Feeding Management Specialist
28	Dr. Mubarak Jatoi	Livestock Genetics Specialist
29	Dr. Zulfiqar Pathan	Animals Health Specialist
30	Dr. Muhammad Arif	Fodder Specialist
31	Dr. Iqtadar Ali Memon	Marketing Specialist
32	Dr. Rukhsana Vighio	Training Specialist
33	Dr. Ali Akhtar Shahani	Animal Reproduction Specialist
34	Dr. Naeem Siddique Ansari	Animals Assets Specialist
35	Dr. Anisa Soomro	Gender Specialist
36	Dr. Farzana Sarki	Social Mobilization Specialist

#	Name of Participants	Designation/Expertise
37	Dr. Mohammad Ibrahim Shaikh	Project Manager Assistant JICA Team
38	Dr. Rasool Bux Soomro	Technical Coordinator JICA Team
39	Mr. Asim Shaikh	Administrative Coordinator JICA Team
40	Ms. Zahida Soomro	Computer Operator JICA Team

Attachment 6-3-4 Minutes of the Third Livestock Development Platform Meeting

Minutes of the Meeting

Type of Meeting	Third Annual Livestock Development Platform Meeting
Date /Time	18 January 2017 10:40 to 17:00
Participants	List attached
Place	Indus Hotel, Hyderabad, Sindh
Meeting agenda	As per the program attached
Attachment	The programme of the meeting, The list of participants

1. Recitation from Holy Quran:

The meeting started with recitation from Holy Quran by Dr. Muhammad Arif Khan, Counterpart for Fodder Development and Production.

2. Welcome address:

Dr. Ali Akbar Soomro, Director General Livestock Sindh/Project Coordinator welcomed the participants and briefed about the objectives and the outline of the project.

3. Keynote address:

Dr. S. Hirashima Senior Visiting Advisor, JICA delivered the keynote address through presentation on 'Agricultural Growth and Social Stability: An implementation of JICA's Livestock Project in Sindh, Pakistan'. The following key concepts were discussed:

1. Agricultural growth is important for social stability in Pakistan
2. The growth rate of agriculture must be more than 4% to absorb surplus labor in the country.
3. Poverty reduction should not focus on only consumption and income per day but focus on structural changes to terminate the discrimination, segregation and alienation associated with poverty.
4. Asset formation is important in terms of poverty reduction as a hedge against risk and uncertainty. Assets holding disparity between those who have and have not is huge.

He discussed that average productive value of buffalo was not taken into consideration in the current livestock census. Pakistan should go for a direction to replace buffalo with high milk yield one instead of increasing number of buffalo to increase milk production. He also shared his view of the internal rate of return of different types of calf salvation scheme and adulteration of milk.

4. Presentation on the progress and achievements till date:

Dr. Jamil Ahmed Shaikh, Project Manager gave the presentation and explained the whole project activities progress and plan.

5. Highlights of livestock technology development 2016:

Dr. Hideo Tominaga and Dr. Ghulam Muhammad Jiskani, Counterpart for farm management gave the presentation on their respective fields and explained the progress and results.

Question & Answer Session (1)

Following the presentations of the counterparts, questions and comments were shared from the participants.

1) Mr. Suleman Abro / President SAFWCO

- He suggested calf banks should be introduced in the villages.
- He suggested farmers be connected with dairy company through establishing milk collection centers so on. Commercial set up is not in villages and should be introduced.
- He suggested the project activity should be extended to other poor districts.

[Dr. Sarwar]

- Dr. Sarwar replied that the activities would be extended to other areas and the idea of calf banks was noted.

2) Dr. Fateh Muhammad Soomro / Dean Animal Sciences SBBUVAS

- He commented animal population in the project area was less than 1/3 of the total animal population in the country. The data, therefore, underrepresent the whole situation in the country.
- In Northern part of Sindh bordering with Punjab buffalo gene was destroyed due to smuggling. It is good if the Project can make mapping of pure gene of buffalo.

[Dr. Sarwar]

- He responded that the Project prioritizes purity of buffalo and will suggest the Livestock Department to go for mapping in next phase.

3) Dr. Aslam Pervaiz Umrani / Director General Livestock Research and Extension

- He commented that the skills for calf rearing and milk production were important for farmers. The Project developed the technologies for that. Now the issue is dissemination. How to disseminate skills at a large scale? Do we have to collaborate with other organizations such as NGOs?
- He shared importance of nutrition. Veterinarians tend to look at disease as a cause of death of animals but nutritional status affects health and immunity as well.
- The Project developed formula feed which gave 8.5 kg milk production results. He commented this milk production is not only because of feed but combination with other technologies.
- He suggested the training should shift from non-technical to technical ones. The training should not be only in the project area but to other districts as well.

[Mr. Suleman Abro/ SAFWCO]

- Mr. Suleman commented the all government departments are there. What we need is coordination.

4) Dr. Muhammad Afzal / Project Coordinator FAO (FMD, PPR) project Islamabad

- He pointed out the colostrum should be fed to newly born calves within 2 to 3 hours instead of within 6 hours. It should be fed at least 5 days and at lib.
- He commented the business model for calf rearing should be developed.

5) Mr. Sarwan Baloch / Programme Officer, SAFWCO

- He raised 3 points, 1) capacity building of beneficiaries is missing, 2) marketing trainings are missing, 3)

number of female beneficiaries is small.

6) Dr. Abdul Qadir Junejo / Director, Monitoring and Planning

- He suggested the Project should focus on technical training such as AI technique, heat detection and pregnancy diagnosis.
- He said formula feed gave good results. The Project should share this technology to farmers and raise awareness among them.
- He said the laboratories established under the Project should be properly utilized.

[Dr. Sarwar]

He explained that under the Project the nutrition laboratory at Poultry Research Institute Karachi has been strengthened and is now fodder samples are being analyzed while one mini laboratory has been established at Hyderabad to analyze milk samples which is functional.

6. Dissemination of technologies and methods to farmers – Progress and expectation (by Ms. Mika Kawamoto and Dr. Rukhsana Vigio)

Dr. Rukhsana Vigio delivered presentation on progress and plan of extension activities.

7. Address by Chief representative of JICA Pakistan office (Mr. Yasuhiro TOJO)

Mr. Yasuhiro Tojo, chief representative of JICA Pakistan office gave his remarks before his departure from Hyderabad for Islambad. He said the platform meeting was important occasion to exchange views and opinions among stakeholders and appreciated participation of all the related stakeholders. He was impressed with the achievements during 3 years by both Pakistani C/P and Japanese team. He wishes the collaboration continue at 4th and 5th year and the project achievements will build the development foundations in the region.

Question & Answer Session (2)

Following the presentations of the counterparts, questions and comments were shared from the participants.

1) Dr. Nasarullah Panhwar / Provincial Coordinator, FMD Project Karachi

- He asked how the Department will utilize trained persons.
- He inquired about intervention to meat development besides dairy development.
- He commented number of parity that affect milk production yield and the Project should take them into consideration.

[Dr. Sarwar]

- Counterparts trained by the Project will continue disseminating technology to other districts after the Project.
- The Project does not cover the meat sector.

2) Mr. Mustafa Rajpur/ MDF/ED

- He asked if the Project has control group to evaluate the effect of project intervention or not.
- He asked how small scale farmers bring their calves to calf salvation center.

[Dr. Sarwar]

- He replied that the Project would use adaptation rate of technology by farmers to evaluate the effect of

project intervention.

3) Mr. Suleman Abro / SAFWCO

- He inquired about the result of mid-term review of the Project.

8. Views of the participants;

Participants from different segments shared their views and comments on the presentations by the Project team.

1) Eng. Ghulam Sarwar Dars / Progressive farmer, Umerkot

- He commented that 1) As for selection of districts, rich and poor districts should be mixed and included, 2) silage making is useful, 3) Use of oxytocin should be stopped since it affects reproduction function of buffalo, 4) Use of lime stone in water as antiseptic is recommended, 5) the Project should not only focus on buffalo but on cow.

[Dr. Sarwar]

He responded that the selection of districts was mainly to avoid any duplication with other projects and also the buffalo population. The Project is concentrating on hay feeding to calves and silage making will be considered in 2nd phase of the Project under the funding from Govt. of Sindh. The farmers are being motivated to avoid the use of oxytocin and adopt all possible hygienic measures. Buffalo is a major milk producing animal therefore is focused.

2) Dr. Fateh Mohammad Soomro / Shaheed Benazir Bhutto University of Veterinary & Animal Sciences Sakrand

- He suggested that 1) the Livestock Department should continue utilizing capacity developed by the Project though appropriating budget, 2) a follow-up study of pilot farms should be made, 3) extension is continuous activities. The Department is better to establish directorate of extension, 4) the Department should establish a livestock experiment center to disseminate technologies.
- The suggestions were noted by the Project Coordinator.

3) Haji Haider Buksh Chalgari/ Farmer, New Cattle colony Tando Muhammad Khan road Hyderabad

- He appreciated the interventions by the Project on reproductive disorder issue.
- He suggested the Livestock Department should focus on rural farmers who face shortage of feed and fodder.

4) Mr. Nadeem Manoo / Dairy Land

- He introduced his calf rearing experiences;
- He is running the company, 'Dairy Land'. Dairy Land sells milk with the name of 'day fresh'.
- His company rears cows. His experience, therefore, ia based on cow, but not buffalo. They keep exotic breed. They have purchased 1,000 animals from Australia. They import semen from USA or Canada. Production is increasing thanks to genetic improvement.
- His company rears 3,500 animals. Last year, 1,600 calves were born. Out of them, 45% are male calves which are sold at 15 to 20 days of age. Female calves are raised in his farm to replace the culled animals. The mortality rate last year was 1.8%. Internationally mortality rate is set at 2%. Hair accumulation in the rumen is the major cause of death of calves. He does not recommend for small scale farmers to use milk replacer since it requires temperature control of milk.

- Colostrum is fed within 2 hours after birth and continuously fed for 5 to 6 days. From day 7, milk replacer is fed to calves. They feed milk 3 times a day. By doing so, they reduced mortality rate of calves.
- The experts on animal husbandry are few. Everybody is doctor (Veterinarian). It is difficult to find a good manager. He requested universities to look into this matter.
- They monitor monthly body weight of calves. The daily gain is 800 g. The weaning timing was previously 90 days. The current weaning timing is 64 days.
- They have succeeded in shortening maturity period of heifer from 13 to 14 months to 12 to 13 months. This is big achievement since the cost of feed is huge and they can reduce it a lot.

5) Dr. Muhammad Afzal / Project Coordinator, FAO

- The recommendation for corporate sector in big cities and recommendation for small scale farmers are different.
- Farmers are interested in profits. If they realize profitability, they will naturally follow technical advice. Focusing on profitability is important. He suggested the Project and Department to work on profitability and business model.
- To build up capacity of small scale farmers, we have to work on it for longer period. The follow-up activities by the Department are necessary.
- For technology transfer, farmers become spokesperson. Once they see their neighbor is earning money, they will be interested.
- Introduction of milk replacer for small scale farmers is difficult since it is difficult to access clean water in rural area.

6) Dr. Masaharu Kanameda / Team leader of JICA Mid-term review mission

- He could see the positive changes within only 5 months after his previous visit to the Project with the efforts of the project team. He hopes more results will come in remaining 2 years.

9. Next actions for livestock sector development in Sindh (facilitated by Dr. Ghulam Sarwar Shaikh)

Mr. Okabe, Team Leader of the Project mentioned that during the project period, the Japanese experts would gradually be phased out and the Department will take more tasks towards the end of the Project. How we can collaborate among stakeholders will become more important.

To facilitate the constructive and positive discussion, he especially requested the participants to give their views and comments on the following 3 points, 1) betterment of the Project, 2) your roles and responsibilities in the sector, and 3) coordination among all of us.

1) Professor Dr. Fatah Muhammad Soomro / Shaheed Benazeer Bhutto Veterinary University Sakrand, SBBVUS

- The University can collaborate with the Department for conducting in-service training of government officers.

2) Dr. Noor Muhammad Soomro / Sindh Agriculture University Tando Jam

- Sindh Agriculture University Tando Jam is currently collaborating with Sindh Agriculture Growth Project

(Livestock component) funded by World Bank. The collaboration with JICA project is always welcomed in the field of capacity building.

3) Dr. Muhammad Afzal / Project Coordinator, FAO

- He suggested that practical training for university students in commercial farms can be organized.
- He can join in the planning session of the project activities so that he could suggest how the collaboration can be developed.

4) Mr. Nadeem Manoo / Dairy Land

- He shared that his company received 6 batches of interns from Faisalabad University. The company also is collaborating with Benazir youth programme. The Project can send interns in small batches to get the hands-on training on his farm.

5) Dr. Muhammad Aiejaz Kumbher / Area Advisor (Male) ASLP Dairy Project Hyderabad

- The ASLP Dairy project was implemented in Thatta and Badin districts of Sindh. The extension material developed under the ASLP dairy project can be used for extension activities by the JICA Project.

6) Dr. Sobia Majeed / Area Advisor (Female) ASLP Dairy Project Hyderabad

- She had impression that few females were involved in the Project. She suggested to use whole family approach, especially in calf rearing.

10. Concluding remarks (Dr. Ali Akbar Soomro / Director General/Project Coordinator)

Dr. Ali Akbar Soomro appreciated the good work of C/P and the project team.

11. Vote of thanks (Dr. Jamil Shaikh / Project manager)

Dr. Jamil Shaikh thanked all the participants for their participation.

The meeting was adjourned.

Third Annual Livestock Development Platform Meeting

List of the Participants

January 18, 2017

Sr. #	Name of the Participants	Designations/ Organization
1	Prof. Dr. Shigemochi Hirashima	Senior Visiting Advisor, JICA Headquarters, Tokyo
2	Mr. Yasuhiro Tojo	Chief Representative, JICA Pakistan Office, Islamabad
3	Dr. Masahiro Kanameda	Leader of MTR mission, Senior Advisor, JICA Headquarters, Tokyo
4	Mr. Makoto Imamura	Rural Development Department, JICA Headquarters, Tokyo
5	Mr. Ken Okumura	Representative, JICA Pakistan Office, Islamabad
6	Mr. Amir Bukhari	Senior Programme Officer, JICA Pakistan Office, Islamabad
7	Dr. Ali Akbar Soomro	Director General, Livestock & Fisheries Sindh/ Project Coordinator
8	Dr. Aslam Pervez Umrani	Director Veterinary Research & Diagnosis, Central Veterinary Diagnostic Laboratory (CVDL) Sindh, Tando Jam
9	Dr. Jamil Ahmed Shaikh	Director Animal Breeding, Sindh Livestock Department, Hyderabad/ Director Poultry Production & Research, Sindh Livestock Department, Karachi / Project Manager
10	Dr. Abdul Qadir Junejo	Director Livestock Planning & Monitoring, Sindh Livestock Department, Hyderabad
11	Dr. Khadim Hussain	Disease investigation officer, Directorate of Animal Husbandry Sindh, Livestock Department, Hyderabad
12	Mr. Muhammad Khan Jarwar	Director Coordinator Agriculture Extension Department, Hyderabad
13	Dr. Sikandar Ali Panhwar	Project Director, Poultry Production Sindh, Phase-1, Hyderabad
14	Dr. Abdul Latif Memon	Deputy Director Livestock / Animal Husbandry, Hyderabad
15	Dr. Syed Riaz Ahmed Shah	Deputy Director Livestock / Animal Husbandry, Matiari
16	Dr. Mehmood Baloch	Deputy Director Livestock / Animal Husbandry, Tando Allahyar
17	Dr. Faiz Muhammad Baloch	Deputy Director Livestock / Animal Husbandry, Tando Muhammad Khan
18	Dr. Kirshan Lal	Deputy Director Livestock / Animal Husbandry, Badin
19	Dr. Noorunisa Mari	Technical Officer, Director General Office, Livestock Department, Hyderabad
20	Dr. Muhammad Ibrahim Shaikh	Veterinary Officer, PSLD
21	Dr. Nizamudin	Veterinary Officer
22	Dr. Syed Muhammad Zeeshan	Assistant Research Officer, PRI, Karachi
23	Dr. Imran Ali	Assistant Research Officer, PRI, Karachi
24	Dr. Noor Muhammad Soomro	Dean, Faculty of Animal Husbandry & Veterinary Sciences Sindh Agriculture University, Tando Jam
25	Prof. Dr. Fateh Muhammad Soomro	Shaheed Benazir Bhutto University of Veterinary Sciences, Sakrand

Sr. #	Name of the Participants	Designations/ Organization
26	Mr. Mukesh Kumar	Provincial Chief Sindh, Small and Medium Enterprise Development Authority (SMEDA)
27	Mr. Syed Bukshal Shah Bukhari	Area Manager, Engro Foods Ltd. Tando Muhammad Khan Area Office
28	Mr. Nadeem Manoo	Dairy Land, Thatta
29	Mr. Ghulam Nabi Shah	Zarai Taraqiati Bank Limited (ZTBL)
30	Mr. Javed Iqbal Arain	Vice President ZTBL Mirpurkhas
31	Mr. Suleman G. Abro	President, Sindh Agricultural and Forestry Workers Coordinating Organization (SAFWCO), Hyderabad
32	Mr. Sarwan Baloch	SAFWCO, Hyderabad
33	Mr. Ghulam Mustafa Baloch	Regional Head, Strengthening Participatory Organization (SPO)
34	Mr. Yameen Memon	Management & Development Foundation (MDF) Hyderabad
35	Mr. Mustafa Rajpur	MDF
36	Dr. Sobia Majeed	Area Advisor (Female), ASLP Dairy Project, Hyderabad
37	Dr. Muhammad Aejaz Kumbher,	Area Advisor (Male), ASLP Dairy Project, Hyderabad
38	Dr. Muhammad Afzal	Project Coordinator, FAO, (FMD, PPR) Project, Islamabad
39	Dr. Nasarullah Panhwar	Provincial Coordinator, FAO (FMD, PPR) Project, Karachi
40	Syed Ali Hyder Shah	General Secretary, Matiari Breeders Association
41	Dr. Lutf Talpur	Breeder, Tando Muhammad Khan
42	Mr. Ashfaq Ahmed Shaikh	Farmer, Matiari
43	Mr. Ghulam Sarwar Dars	Farmer, Umerkot
44	Mr. Jalaludin Abbasi	Farmer
45	Mr. Hassan Iqbal Nagori	Commercial farmer, Cattle Colony, Hyderabad
46	Mr. Haji Haider Bux Chalgari	Commercial farmer, Cattle Colony, Hyderabad
47	Mr. Hiroshi Okabe	JICA Project Expert (Team Leader / Institutional Development)
48	Dr. Hideo Tominaga	JICA Project Expert (Livestock Technology Development)
49	Ms. Fumiko Ikegaya	JICA Project Expert (Deputy Team Leader / Marketing)
50	Ms. Noriko Hara	JICA Project Expert (Livestock Technology Development / Coordination)
51	Ms. Mika Kawamoto	JICA Project Expert (Livestock Extension Services / Gender)
52	Mr. Kodai Yugeta	JICA Project Expert (Training Management)
53	Dr. Ghulam Muhammad Jiskani	JICA Project Counterparts (Farm Management)
54	Dr. Muhammad Mubarak Jatoi	JICA Project Counterparts (Livestock Genetic Improvement)
55	Dr. Ali Akhtar Shahani	JICA Project Counterparts (Livestock Reproduction)
56	Dr. Muhammad Arif Khan	JICA Project Counterparts (Fodder Development & Production)
57	Dr. Iqtadar Ali Memon	JICA Project Counterparts (Marketing)
58	Dr. Rukhsana Vighio	JICA Project Counterparts (Training)
59	Dr. Naeem Siddique Ansari	JICA Project Counterparts (Livestock Asset Development)

Sr. #	Name of the Participants	Designations/ Organization
60	Dr. Safdar Ali Fazlani	JICA Project Counterparts (Feeding Management)
61	Dr. Zulfiqar Ali Pathan	JICA Project Counterparts (Animal Health)
62	Dr. Aneesa Soomro	JICA Project Counterparts (Gender Specialist)
63	Dr. Farzana Ayaz Sarki	JICA Project Counterparts (Social Mobilizer)
64	Dr. Ghulam Sarwar Shaikh	JICA Project General Coordinator
65	Dr. Rasool Bux Soomro	JICA Project Technical Coordinator
66	Mr. Asim Shaikh	JICA Project Local Assistant
67	Ms. Zahida Soomro	JICA Project Data Entry Assistant

Third Annual Meeting of
Livestock Development Platform

AGENDA

Wednesday, January 18, 2017
Indus Hotel, Hyderabad

The major stakeholders of the livestock sector in Sindh are invited to this livestock development platform meeting.
The main purpose of this meeting is to facilitate the discussion among the stakeholders on the direction of the livestock sector development in Sindh and the roles and responsibilities which each of them is expected to carry.
In particular, the Department is now planning to make a livestock development policy for Sindh. This meeting is expected to have certain implication for this policy making.
For that purpose, after the presentation by the project team on the project plan and progress, we would like to ask the participants for the feedbacks particularly on the follow points:

1. Your views on how the project could contribute more on the livestock sector development in Sindh
2. What roles and responsibilities you have for the development of the livestock sector
3. How practically you or your organization and the Project can be coordinated

At the end of the meeting, we expect that the participants have a consensus on the next actions necessary for the establishment of the policy for the livestock sector development in Sindh.

This Platform Meeting is organized by the Project on Sustainable Livestock Development for Rural Sindh, implemented by JICA and Livestock and Fisheries Department, Government of Sindh.

Third Annual Meeting of
Livestock Development Platform

PROGRAMME

Wednesday, January 18, 2017
Indus Hotel, Hyderabad

The Project on Sustainable Livestock Development for Rural Sindh

Time	Activities	Resource person
9:30-10:00	Guest registration	Project Staff
10:00	Recitation from Holy Quran	Dr. Muhammad Arif Khan
10:05	Welcome address	Dr. Ali Akbar Soomro, Project Coordinator
10:10	Keynote address	Dr. Shigemochi Hirashima
10:40	Presentation on the Project progress and achievements till date	Dr. Jamil Shaikh, Project Manager
11:00	**Tea break**	
11:20	Highlights of livestock technology development of the Project in 2016	Dr. Hideo Tominaga and Project counterparts
11:50	Question & Answers	Facilitator Mr. Hiroshi Okabe, Team Leader of JICA Project Team, Dr. Ghulam Sarwar Shaikh, General Coordinator of JICA Project Team
12:10	Dissemination of technologies and methods to farmers – progress and expectation	Ms. Mika Kawamoto/Dr. Rukhsana Vighio
12:40	Question & Answers	Facilitator Mr. Hiroshi Okabe, Dr. Ghulam Sarwar Shaikh
13:00	**Lunch & Prayer break**	
13:40	Views of the participants: University NGOs Private Sector (marketing) Donor Projects Progressive Farmers Livestock holders in Cattle colony/Farmer	Representation from each segment appreciated
14:10	Next actions - For the development of livestock sector in Sindh	Facilitator Mr. Hiroshi Okabe Dr. Ghulam Sarwar Shaikh
14:30	Policy remarks	Mr. Ghulam Hussain Memon Secretary Livestock & Fisheries Department Govt. of Sindh
14:50	Vote of thanks	Dr. Jamil Ahmed Shaikh, Project Manager
15:00	**Evening tea**	

Attachment 6-3-5 Minutes of the Fourth Steering Committee Meeting

Minutes of the Meeting

Type of Meeting	The fourth Project Steering Committee Meeting
Date /Time	19 January 2017 11:00 to 14:00
Participants	List attached
Place	Indus Hotel, Hyderabad, Sindh
Meeting agenda	As per the program attached
Attachment	The programme of the meeting, The list of participants

1. Recitation from Holy Quran:

The meeting started with recitation verses from Quran by Dr. Muhammad Arif Khan, Counterpart for Fodder Development and production

2. Introduction of the participants:

Dr. Ghulam Sarwar Shaikh requested all participants to introduce themselves individually.

3. Welcome address:

Dr. Ali Akbar Soomro, Director General Livestock Sindh/Project Coordinator welcomed the participants in the fourth project steering committee.

4. Implementation / Progress made so far on the findings/recommendations of the JICA mid-term review mission:

Dr. Jamil Ahmed Shaikh, project manager reported the progress on the recommendation of JICA mid-term review mission described in the column of 'Recommendation by JICA review mission'. Dr. Jamil mentioned that finance department has changed the policy for releasing budgets. Budgets were released on quarterly basis previously. Now the budget is released either for 6 months or 1 year upon the needs of the project. The department already submitted DRO for first 6 months, i.e. from June to December 2016. The second 6 month DRO will be submitted soon. He hopes that budgets for second 6 month will be released soon.

5. View of the JICA Mid-term Review Mission conducted in September 2016:

Dr. Masaharu Kanameda, team leader of Mid-term review mission initiated the discussion by inquiry about schedule of PC-1 revision;

Dr. Aslam Pervaiz Umrani DG research & extension: Though the department is applying for PC-1 revision, the budgets from the original PC-1 will not be stopped. The department can continue to avail these budgets for project activities. As for the vehicle procurement, the budgets for vehicle were already re-appropriated from other budgets. If the PC-1 revision is on agenda of CDWP to be held in Jan. or Feb., it will be approved soon..

Mr. Bukhari, Senior Programme officer JICA Pakistan office: He questioned the availability of budgets from the second 6 month DRO. If the department is applying PC-1 revision, the second 6 month DRO will be released only after the approval of PC-1 revision. Considering processing time, it will take some time for budgets to be released.

Dr. Aslam Pervaiz Umrani: New finance department policy only conditioned 60% utilization of budgets for allowing the release of the next budget regardless of approval of PC-1. Previously required utilization rate was 80%, but now it has changed to 60%. Usually it takes 20 to 30 days for the release of the budgets after the approval of PC-1.

Mr. Makoto Imamura, representative of JICA HQ: He mentioned if the salary of 17 extension staff is not released, JICA will suspend dispatch of Japanese experts. He showed concern that if procurement of vehicles is not completed by June, the budget for the current year will be cancelled. He said that without human resources, transportation and payment, it is difficult to continue extension activities and achieve the project targets within 2 years of the project period. As the person in charge of this project in JICA, it should be confirmed with the department in today's meeting on the concrete schedule when the issues would be solved. JICA, then, will send a letter to the secretary livestock to make sure the schedule made by the department is fulfilled.

Dr. Jamil Shaikh, Project Manager: The salary for 17 extension staff will be made on 1st February 2017. As for procurement of vehicle, budgets were already re-appropriate and will be allocated to the project in this month. Vehicle will be procured by the end of April. As for the budgets for project activities, the second 6 month DRO will be submitted to finance department soon.

Dr. Ali Akbar Soomro, DG /Project Coordinator: In the first week of February, salary for the month of January will be paid to all extension staff. The remaining salary will be paid by the end of February.

Dr. Aslam Pervaiz Umarani: As for the vehicle, 1 week is required for submission of DRO and bill. In 2 weeks payment will be deposited to account of a company. Vehicles will be delivered to the department accordingly. It will be the end of April for all the process to be completed and for all the vehicles to be made available for the project.
Regarding the PC-1 approval, in case of Master Plan Study, the project was not on the agenda 2 times. It depends on how much priority the federal government place on the project. The priority on agriculture sector is 4 to 5th in order. Sindh government has low influence on priority setting of CDWP meeting. It's beyond the Sindh government responsibility.

Mr. Makoto Imamura: How the livestock department can follow up this issue?

Dr. Aslam Pervaiz Umrani: Senior Chief of P&D department, Sindh Government has contact with Planning commission (Agriculture). He can follow it up. ACS (dev) is a member of planning commission. It is

suggested JICA to write a letter to ACS to follow up this matter and JICA team to have a meeting with him.

Mr. Ken Okumura, representative JICA Pakistan office: As for first 6 month DRO, how much proportion has been utilized so far?

Dr. Jamil Shaikh: After paying salary of 17 staff and TA/DA to the project staff, more than 60% of budgets will be utilized.

Mr. Bukhari: Next DRO should be submitted immediately.

Dr. Aslam Pervaiz Umrani: In case of development budget, even budgets are not utilized by the end of the project, it will be released and project time will be extended.

Mr. Bukhari: If the budgets from the livestock department will not be released, the experts cannot work, which will affect overall progress of the project activities. JICA cannot extend the project period even if the project budgets are not fully utilized. JICA is seriously concerned with the current situation of the livestock department.

[Schedule for actions taken by the livestock department]

Mr. Makoto Imamura started confirming concrete schedule for each action taken by the livestock department with the table attached.

Schedule of all the actions to be taken by the livestock department was confirmed by the concerned officers as mentioned in the attached table.

Dr. Masaharu Kanameda concluded the discussion with following remarks;

1) If the salary of 17 extension staff is not paid by February 2017 as mentioned in this meeting, JICA will delay dispatch of the Japanese experts.
2) If no tangible action is made by the department by June 2017, JICA will change scope of the project.
3) The worst and possible scenario would be suspension of all project activities.

6. Project Design Matrix (PDM) Version 3 – Project indicators:

Mr. Hiroshi Okabe, team leader of the project explained about the project plan including the goals and indicators in the PDM version 3 to the participants.

7. Closing remarks:

Dr. Aslam Pervaiz Umrani, DG research and extension mentioned PDM and time table for actions by the department gave guideline for actions to be taken by the department. He thanked Dr. Hirshima, JICA mission and Japanese people. He appreciated the continuous support and grant from Japanese people even though Japan is suffering from natural disasters. Pakistani people should respond and show their responsibility.

The meeting was adjourned.

Fourth Steering Committee Meeting
List of the Participants
January 19, 2017

Sr. #	Name of the Participants	Designations/ Organization
1	Prof. Dr. Shigemochi Hirashima	Senior Advisor, JICA Headquarters, Tokyo
2	Dr. Masaharu Kanameda	Senior Advisor, JICA Headquarters, Tokyo
3	Mr. Makoto Imamura	JICA Headquarters, Tokyo
4	Mr. Ken Okumura	Representative, JICA Pakistan Office, Islamabad
5	Mr. Amir A. Bukhari	Senior Programme Officer, JICA Pakistan Office, Islamabad
6	Dr. Ali Akbar Soomro	Director General, Livestock & Fisheries Sindh/ JICA Project Coordinator
7	Dr. Aslam Pervez Umrani	Director General, Research & Extension Director Veterinary Research & Diagnosis, Central Veterinary Diagnostic Laboratory (CVDL) Sindh, Tando Jam
8	Dr. Jamil Ahmed Shaikh	Director Animal Breeding, Sindh Livestock Department, Hyderabad/ Director Poultry Production & Research, Sindh Livestock Department, Karachi /JICA Project Manager
9	Dr. Abdul Qadir Junejo	Director Livestock Planning & Monitoring, Sindh Livestock Department, Hyderabad
10	Dr. Khadim Hussain Soomro	Disease investigation officer, Directorate Animal Husbandry, Sindh Livestock Department
11	Mr. Ghulam Mustafa Memon	Deputy Director, Agriculture and extension, Matiari
12	Dr. Kirshan Lal	Deputy Director Livestock / Animal Husbandry, Badin
13	Dr. Noorunisa Mari	Technical Officer, Director General Office, Livestock Department, Hyderabad
14	Dr. Muhammad Ibrahim Shaikh	Veterinary Officer, PSLD
15	Mr. Hiroshi Okabe	JICA Project Expert (Team Leader / Institutional Development)
16	Dr. Hideo Tominaga	JICA Project Expert (Livestock Technology Development)
17	Ms. Fumiko Ikegaya	JICA Project Expert (Deputy Team Leader / Marketing)
18	Ms. Noriko Hara	JICA Project Expert (Livestock Technology Development / Coordination)
19	Ms. Mika Kawamoto	JICA Project Expert (Livestock Extension Services / Gender)
20	Mr. Kodai Yugeta	JICA Project Expert (Training Management)
21	Dr. Ghulam Muhammad Jiskani	JICA Project Specialist (Farm Management)
22	Dr. Muhammad Mubarak Jatoi	JICA Project Specialist (Livestock Genetic Improvement)
23	Dr. Ali Akhtar Shahani	JICA Project Specialist (Livestock Reproduction)
24	Dr. Muhammad Arif Khan	JICA Project Specialist (Fodder Development & Production)
25	Dr. Iqtadar Ali Memon	JICA Project Specialist (Marketing)

Sr. #	Name of the Participants	Designations/ Organization
26	Dr. Rukhsana Vighio	JICA Project Specialist (Training)
27	Dr. Naeem Siddique Ansari	JICA Project Specialist (Livestock Asset Development)
28	Dr. Safdar Ali Fazlani	JICA Project Specialist (Feeding Management)
29	Dr. Zulfiqar Ali Pathan	JICA Project Specialist (Animal Health)
30	Dr. Farzana Ayaz	Social Mobilizer
31	Dr. Anisa Soomro	Gender Specialist
32	Dr. Kabeer Ali	Mater Trainer, Badin
33	Dr. Muhammad Mubeen	Mater Trainer, Hyderabad
34	Dr. Farooque Ahmed	Mater Trainer, Matiari
35	Dr. Ali Raza	Mater Trainer, Tando Allahyar
36	Dr. Iqbal Ahmed Memon	Mater Trainer, Tando Muhammad Khan
37	Mr. Muhammad Sharif	Extension Worker, Badin
38	Mr. Zahid Ali Boohar	Extension Worker, Badin
39	Mr. Arif Ali Junejo	Extension Worker, Hyderabad
40	Mr. Muhammad Ahsan Khan	Extension Worker, Hyderabad
41	Mr. Abdul Mannan Rahu	Extension Worker, Matiari
42	Mr. Ashfaque Ali	Extension Worker, Matiari
43	Mr. Abdul Ghani	Extension Worker, Tando Allahyar
44	Mr. Nasrullah	Extension Worker, Tando Allahyar
45	Mr. Barkat Ali Shaikh	Extension Worker, Tando Muhammad Khan
46	Mr. Meva Ram	Extension Worker, Tando Muhammad Khan
47	Dr. Ghulam Sarwar Shaikh	JICA Project General Coordinator
48	Dr. Rasool Bux Soomro	JICA Project Technical Coordinator
49	Mr. Asim Shaikh	JICA Project Office Secretary
50	Ms. Zahida Soomro	JICA Project Data Entry Assistant

The Project on Sustainable Livestock Development for Rural Sindh

AGENDA

Fourth Project Steering Committee Meeting
Thursday, January 19, 2017
Indus Hotel, Hyderabad

Time	Activities	Resource person
11:00	Opening	General Coordinator of JICA Project Team Dr. Ghulam Sarwar Shaikh
11:05	Recitation from Holy Quran	Dr. Muhammad Arif Khan
11:07	Introduction of the participants	by self
11:15	Welcome Address	Project Coordinator Dr. Ali Akbar Soomro
11:20	Implementation/Progress made so far on the findings/recommendations of the MTR Mission	Project Manager Dr. Jamil Ahmed Shaikh
11:30	Discussion	Facilitator Dr. Ghulam Sarwar Shaikh
13:30	Project Design Matrix (PDM) version 3 – Project plan and goals	Mr. Hiroshi Okabe
14.00	Closing remarks	DG research & extension Dr. Aslam Pervaiz Umrani
	Lunch	

* Agenda was reorganized on the day of meeting.

The Project on Sustainable Livestock Development for Rural Sindh

Recommendations by JICA Mid-term Review Mission and Progress

January 19, 2017

*The highlighted parts are the schedule confirmed in the 4th SC meeting

No.	Recommendations by JICA Mid-term Review Mission	Actions to be taken	Responsible persons	Due date of the actions	**Progress or remaining issues to be solved as of December 28, 2016***
1	Input for supporting Breeders' Association should be optimized within the range of achievement of Project Purpose.	The Project will concentrate only on milk test and pedigree registration, but will not work for establishment or strengthening of the Breeders' Associations.	Project Team (tech. development team)	Immediately	This has already been taken into account.
2	Method of utilization of buffalo calf and dry buffalo should be made economically viable for the target group.	The Project will work on it as recommended, and the results will be shown in the Guideline at end of 3rd year for buffalo calves and 4th year for dry buffaloes.	Project Team (tech. development team)	As indicated	On-going
3	Involvement of incumbent technical staff (VOs) and para-technical staff (SAs) in the pilot districts should be incorporated within the present activity for securing sustainability.	It is expected that the VOs and SAs become able to provide useful messages to farmers on livestock production in their routine work. The Department will allocate funds necessary for the Project to conduct training to them in the revised PC-1. Such training will take place at 4th and 5th years.	Responsible officers of the Department for PC-1 revision and Project Team (tech. development team and extension team) for training	Training plan will be included in the work plan of the Project for 4th and 5th years.	The training plan has been included in the revised PC-1 draft. This has been included in the PDM ver.3 (draft).

No.	Recommendations by JICA Mid-term Review Mission	Actions to be taken	Responsible persons	Due date of the actions	**Progress or remaining issues to be solved as of December 28, 2016***
4	Current 5 Focal Persons also should be continuously engaged in the Project for utilization of their knowledge and experiences.	It is confirmed that 5 Focal Persons be continuously engaged in the Project, and the Department will allocate necessary funds in the revised PC-1.	Responsible officers of the Department for PC-1 revision	Immediately	This has been included in the revised PC-1 draft. → **TA/DA to FP will be paid continuously regardless of PC-1 revision.**
5	The project should consider pilot farmers as possible facilitators for farmer-to-farmer knowledge dissemination.	The Project will consider it as recommended, including the core farmers as facilitators. The Department will allocate funds necessary for the Project to organize demonstration visit to these farmers in the revised PC-1.	Responsible officers of the Department for PC-1 revision and Project Team for demonstration visit	Demonstration visit plan will be included in the work plan of the Project for 4th year.	This has been included in the revised PC-1 draft. This will be included in the 4th year plan.
6	Effective strategy of human resource development plan should be prepared and training opportunity should be allocated to the appropriate number and position of staff following the plan.	The Dep't will prepare a human resource dev't strategy (tentative) with the Project on technical as well as non-technical aspects. Cost for technical training will be born by the Dep't in the revised PC-1, while non-technical training be born by the Project as before and additionally by the Dep't.	Responsible officers of the Department for PC-1 revision, and CBU and Project Team for preparation of a human resource development strategy	A human resource development strategy will be included in the work plan of the Project for 4th year.	This has been included in the revised PC-1 draft. This will be included in the 4th year plan.

No.	Recommendations by JICA Mid-term Review Mission	Actions to be taken	Responsible persons	Due date of the actions	**Progress or remaining issues to be solved as of December 28, 2016***
7	Follow-up after training should be considered for utilization of outcome by the staff.	This has been considered already by the Project, but it will be intensified.	CBU, assisted by Project Team (capacity development team)	Immediately	This has been taken into account in the 3rd year training.
8	For smooth and effective dissemination of technologies, coordination between Output 1 and Output 3 should be improved.	The Project will revise the Technology Development Check List in accordance with the current Appropriate Technology List, and Extension guideline will also be prepared by the entire project staff for extension workers.	Project Team	By the end of 3rd year	The Appropriate Technology Development Checklist and the Extension Guideline have been revised.
9	The current PDM (version 2) should be reviewed and revised based on the suggestions made by MTR study team.	The Project will review and revise the PDM by end of December. The revised PDM will be explained for approval at the 2nd Special Steering Committee Meeting to be held in January 2017.	Project Team	As indicated	The PDM ver.3 draft has been prepared. The Appropriate Technology Checklist has been revised by the Project team.
10	Supporting system for Project Manager(PM) till full-time PM recruited should be strengthened.	The Department will make sure that PM is strongly guided by DGs and all the directors.	DGs	Immediately	**After PC-1 revision, full-time manager will be recruited with the following schedule.** **1. Advertisement in newspaper in a month** **2. Selection committee will be organized in 15**

No.	Recommendations by JICA Mid-term Review Mission	Actions to be taken	Responsible persons	Due date of the actions	**Progress or remaining issues to be solved as of December 28, 2016***
					days. **3. Scrutinize candidate application one week** **4. Interview one day** **5. Notification one week** **6. Report to the Dept.** **In total 2 months.**
11	The mechanism of PC-1 budget release should be shared with the Project execution team for both sides.	(1) The Project will make clear when and what information should be shared by the Department to them at regular basis, and (2) the Department will do the same to the Project.	(1) Team Leader, JICA Project Team, (2) Project Manager	Immediately	The flow of PC-1 budget release was explained by PM and Dr. Sarwar to the Project team.
12	Incumbent technical and para-technical staff should be given the opportunity to learn Project outcomes (appropriate technologies).	As mentioned in No.3			As mentioned in No.3
13	Rapid actions for making PRI sustainably operational and effective use of laboratory equipment procured by JICA in mini-laboratory in the Department building as well as in PRI	The Department will complete necessary work seriously for the equipment provided by JICA at PRI and mini-laboratory to be functional. The Department will allocate a CVDL	PM	End of August 2016	A sustainable electric supply is now available at PRI. The mini-lab is also operational now.

No.	Recommendations by JICA Mid-term Review Mission	Actions to be taken	Responsible persons	Due date of the actions	**Progress or remaining issues to be solved as of December 28, 2016***
	should be planned and implemented.	officer to work at mini-laboratory.			
14-1	Relevant support and advise to earlier settlement of the following delayed issues should be processed among the related government offices with shared time-schedule: (1) purchase of vehicles and motorbikes	Secretary Livestock will send a re-appropriation proposal to Finance Department through P&D Department	Secretary Livestock	Immediately	Financial Department has already approved the re-appropriation proposal, therefore the vehicles and motorbikes will be purchased soon. → **By April 2017**
14-2	(2) recruitment of 10 female extension workers	The requirement of extension worker will be made clear in the revised PC-1.	Responsible officers of the Department for PC-1 revision	By end of February 2017	This has been included in the revised PC-1 draft. **After PC-1 revision** **1. Advertisement in newspaper in a month** **2. Selection committee will be organized in 15 days.** **3. Scrutinize candidate application for one week** **4. Examination 20 days**

No.	Recommendations by JICA Mid-term Review Mission	Actions to be taken	Responsible persons	Due date of the actions	**Progress or remaining issues to be solved as of December 28, 2016***
					5. Interview 15 days **6. Notification 1 month** **7. Medical and police certificates one month** **8. Final notification one week** **9. Report to the Dept. one week** **In total 5 months.**
14-3	(3) revision of PC-1	Draft of the revised PC-1 will be sent to Secretary Livestock from the Department, and to P&D Dept. from Secretary Livestock	Secretary Livestock and Responsible officers of the Department for PC-1 revision	September 9	The meeting of the Technical Committee was held on October 10, 2016 under the Chairmanship of Secretary (Planning) at P&D Dept. The PDWP has already approved the revised PC-1 draft, which has been sent to the Federal gov't for approval.
14-4	(4) recruitment of full-time Project	Immediately after the revised PC-1 is		By end of February	This has been included

No.	Recommendations by JICA Mid-term Review Mission	Actions to be taken	Responsible persons	Due date of the actions	**Progress or remaining issues to be solved as of December 28, 2016***
	Manager	approved, Secretary Livestock will reorganize the selection committee.		2017	in the revised PC-1 draft. **as mentioned in 10**
14-5	(5) Project allowances to counterpart staff	Immediately after the revised PC-1 is approved, the Department will start paying allowance to the counterpart staff.		By end of February 2017	**It will be paid after two months from PC-1 approval.** **JICA will cover allowances only by March 2017.**
15	Continuous support for assignment of human resources, provision of budget and equipment by PC-1, and PC-4 in the future (after the Project).	PC-4 will be prepared in August 2018.	The Department	As indicated	
16	Revised PC-1 shall be designed and approved in such a manner that all the technologies developed through JICA assistance reach to targeted number of farmers.	The Department will prepare the draft of revised PC-1 in collaboration with the Project Team, taking the recommendations into consideration. The draft will be sent to Secretary Livestock when completed.	Responsible officers of the Department for PC-1 revision	August 26	The revised PC-1 draft has been prepared as suggested.
17	JICA budget for the 4th year project activities should be carefully examined in proportion to the counterpart fund of Sindh government, which has already	JICA may take some actions depending on the situations in February 2017.	JICA Headquarters	February 2017	

No.	Recommendations by JICA Mid-term Review Mission	Actions to be taken	Responsible persons	Due date of the actions	**Progress or remaining issues to be solved as of December 28, 2016***
	been behind schedule, for the fear of further delay. The progress of PC-1 release and input from Livestock Department should be confirmed not later than February, 2017 for JICA's action.				

Attachment 6-4-1 Minutes of the Fifth Steering Committee Meeting

Minutes of Meeting

Title	5th Steering Committee Meeting
Date / Time	25th May 2017, 11:15-13:30
Place	Diamond Hall, Indus Hotel, Hyderabad
Participants	See the attached Participant List
Agenda	To discuss and make consensus on PDM ver. 3 draft and the 4th year's Work Plan To share progress on major Project issues

1. Recitation from Holy Quran

2. Introduction of the Participants

3. Welcome Address

Upon opening the meeting, Dr. Ali Akbar Soomro, Director General/Project Coordinator, welcomed the participants in his welcome address.

4. Explanation of the Meeting Agenda

Dr. Aslam Pervez Umrani, Project Manager, highlighted that the major objective of the today's meeting is to get approval on Project plan and activities indicated in the draft version of PDM ver.3 and the 4th year's work plan.

5. Overall Work Plan for the 4th Year

Mr. Okabe, Team Leader JICA Team, made an overall explanation on Project goals, Project activities and progress in the past 3 years, and the work plan for the 4th yea. He also explained the sustainability measures that the Project has taken for the continuation of the project activities after the project period.

After presentation, Mr. Amir Bukhari, Senior Program Officer, JICA Pakistan Office shared his concerns that they still could not see clear deadlines on how the sustainability measures that Mr. Okabe explained such as establishment of Capacity Building Unit (CBU), development of human resource development strategy (HRDS) and establishment of extension structure in non-pilot districts would be achieved. Mr. Okabe answered that these measures are not clearly indicated in the PDM, but important to enhance the Project sustainability. He mentioned that CBU had been just reorganized with a full-time focal person and started collecting biodata from all the Department officers to develop a database on human resources. He also explained that the Project just had a one-day workshop with about 30 officers of the Department to discuss the needs of HRDS this week, and based on its results a 5 day training to develop a draft HRDS would be designed and conducted in this October. Extension structure of the Department would also be developed through training on the same topic. The intension is not to re-structuring the Department but to utilize the experiences the Project has gained so that most appropriate structure for extension would be established to both pilot and non-pilot districts to continue the activities after JICA Project periods.

Secondly, Mr. Bukhari suggested that the Department should start thinking of how to synchronize these efforts on sustainable basis with the other regular activities of the Department so that the fruits of the Project

would be continuously utilized by the Department. Replying on this, Dr. Umrani suggested that we should have a workshop to discuss specifically on Project sustainability and have a clear design on how to continue the Project activities, the results of which would be shared in the next Steering Committee Meeting. Mr. Okabe agreed on this idea.

6. Detail Work Plan and Targets for the 4th Year on Technology Development

Dr. Ghulum Muhammad Jiskani, C/P Farm Management, shared the experience gained in the third country training in Thailand, progress in the last 3 years, detail of the 4th year's work plan on appropriate technology development in each of the 8 technical fields.

7. Detail Work Plan and Targets for the 4th Year on Extension

Dr. Aneesa Soomro, C/P Extension (Extension Team Leader), shared the detail of the 3rd year's progress and the 4th year's work plan on extension activity.

8. Open Discussion on Work Plan of the 4th Year

The 4th year's Project work plan was approved by the participants without any comments or objections.

9. Confirmation on the Progress on the Main Issues and Closing Remarks

Mr. Ghulum Hussain Memon, Secretary Livestock, shared the following progress on the main Project issues to be resolved by the Sindh Government: (1) Arrear in payment of salary to extension team has been completed. (2) Revision of PC-1 is completed and now waiting for approval/authorization letter by Planning Commission, Islamabad. (3) Interview will be conducted on May 29 for recruitment of female extension workers. (4) 11 motorcycles will be distributed to extension workers immediately after the today's meeting. Payment has been made to 2 motor companies. Suzuki company has guaranteed to provide vehicles and distribute by the end of August. The local authorized dealer of Toyota has ensured to provide vehicles by the end of August. (5) Project Manager was officially assigned and Deputy Project Manager, already selected, will be joining the Project by mid-June after approval of the revised PC-1.

Then Mr. Memon also replied to the following 2 points raised by Mr. Bukhari from JICA: (1) A new male Master Trainer to replace the previous one for Tando Allahyar district will be recruited by the end of August, and till the recruitment the new Deputy Project Manager will carry out the extension activities in Tando Allahyar. (2) The Department will consider how to synchronize Project activities with its own duties.

Upon closing the meeting, Mr. Memon appreciated the joint efforts of JICA Project Team and his Department staff and the counterparts to resolve all the above Project issues and assured the participants of the success of the Project.

end.

Mr. Ghulum Hussain Memon
Secretary Government of Sindh, Livestock and Fisheries Department

Dr. Ali Akbar Soomro
Project Coordinator

Dr. Aslam Pervez Umrani
Project Manager

Mr. Hiroshi Okabe
Team Leader, JICA Project Team

The Project on Sustainable Livestock Development for Rural Sindh

Participant List

#	Name of Participants	Designation/Expertise
1	Mr. Ghulum Hussain Memon	Secretary Livestock
2	Dr. Ali Akbar Soomro	Director General / Project Coordinator
3	Dr. Aslam Pervez Umrani	Project Manager
4	Mr. Amir A. Bukhari	Senior Program Officer, JICA Pakistan Office
5	Dr. Jameel Ahmed Shaikh	Executive Director Animal Breeding
6	Dr. Hafeez-u-Rehman Kaihoro	Assistant Chief Livestock & Fisheries, P&D Department
7	Dr. Abid Hussain Qureshi	Director, Agricultural Extension Department
8	Dr. Sikandar Ali Panhwar	Project Director, Poultry Production
9	Dr. Mahmood Baloch	Deputy Director Tando Allahyar
10	Dr. Zakhir Hussain Subahpoto	Deputy Director Tando Muhammad Khan
11	Dr. Ghulum Rasool Jatoi	Deputy Director Hyderabad
12	Dr. Kirshan	Deputy Director Badin
13	Dr. Lal Bux Watto	Deputy Director Matiari
14	Dr. Muzaffer Ali Vighio	Livestock Development Office, Sindh
15	Dr. Noor-un-Nisa Mari	Technical Officer, DG Office
16	Dr. Abdul Manan Khokar	Veterinary Officer, Animal Husbandry
17	Mr. Hiroshi Okabe	Team Leader / Institutional Development Expert
18	Ms. Fumiko Ikegaya	Deputy Team Leader / Marketing Expert
19	Ms. Noriko Hara	Appropriate Technology Development 2 Expert
20	Mr. Kodai Yugeta	Training Management Expert
21	Ms. Mika Kawamoto	Extension / Gender Expert
22	Dr. Ghulam Sarwar Shaikh	General Coordinator
23	Dr. Ghulam Muhammad Jiskani	Farm Management Specialist
24	Dr. Safdar Ali Fazlani	Feeding Management Specialist
25	Dr. Mubarak Jatoi	Livestock Genetics Specialist
26	Dr. Zulfiqar Pathan	Animals Health Specialist
27	Dr. Muhammad Arif	Fodder Specialist
28	Dr. Iqtadar Ali Memon	Marketing Specialist
29	Dr. Rukhsana Vighio	Training Specialist
30	Dr. Ali Akhtar Shahani	Animal Reproduction Specialist
31	Dr. Naeem Siddique Ansari	Animals Assets Specialist
32	Dr. Anisa Soomro	Gender Specialist
33	Dr. Farzana Sarki	Social Mobilization Specialist
34	Dr. Farooq Ahmed Memon	Master Trainer Matiari
35	Dr. Kabeer Ali	Master Trainer Badin
36	Dr. Iqbal Memon	Master Trainer Tando Muhammad Khan

37	Dr. Muhammad Mubeen	Master Trainer Hyderabad
38	Dr. Muhammad Ibrahim Shaikh	Assistant Project Manager
39	Dr. Rasool Bux Soomro	Technical Coordinator
40	Mr. Asim Shaikh	Administration Coordinator JICA Team
41	Ms. Zahida Soomro	Technical Coordinator 2

Attachment 6-4-2 Minutes of the Fourth Livestock Development Platform Meeting

Minutes of Meeting

Title	4th Livestock Platform Meeting
Date / Time	12th December 2017, 10:45-15:15
Place	Indus Hotel, Hyderabad
Participants	See the attached Participants List
Agenda	To share the progress and highlight the 4th year's important Project activities To discuss next actions for development of livestock sector in Sindh
Attachment	1. Meeting Agenda 2. Meeting Program 3. Participant List

1. Recitation from Holy Quran

2. Introduction of the Participants

3. Welcome Address

Dr. Ali Akbar Soomro, D/G Livestock, as well as Project Coordinator, welcomed the participants upon opening the meeting. He appreciated the effort of all the persons involved in the Project to have developed appropriate technologies that rural livestock farmers apply. Besides, he especially appreciated devoted contributions of Project C/P and suggested utilizing or publishing the outcomes from Project activities for their future Ph.D. or other research works since they deserve such academic rewards.

4. Implication of PSLD for the Development of Livestock Sector in Sindh

Mr. Hiroshi Okabe, Team Leader, JICA Project Team, explained the meaning and role of PSLD, which was formulated to verify the strategies proposed in the Master Plan Study for the increase in assets and incomes of small livestock farmers in the Sindh Province. The Study is implicated with the potentials of the development of the livestock sector through which the production of milk and meat, and as a result, the incomes and assets of small farmers would be significantly increased since there is technical room for improvement in milk production by small farmers at supply side, and there is huge market on milk and meat at demand side. To enable them, however, a development foundation, i.e. low-cost livestock technologies including milk marketing, technology dissemination, and responsible organizations, should be developed.. PSLD is being implemented for meeting such challenges.

Mr. Okabe also insisted that dairy development requires particular knowledge and experience on livestock management such as fodder, reproduction, genetic improvement, marketing, etc. It requires the Department shift its role from veterinary service providers to holistic dairy service providers. And, the role of this holistic dairy service providers needs to be shared among the other key stakeholders, the participants of today's meeting.

5. Presentation on the Project Progress and Achievements till Date

Dr. Aslam Pervez Umrani, Project Manager, explained the outline of the Project, and shared the progress and

achievements of the activities until the 4th year for each of the four major Project Outputs.

6. Highlights of Livestock Technology Development 2017 – Buffalo Calf Salvation and Fodder Development

Dr. Ali Akhtar Shahani, C/P Animal Reproduction, shared the Project achievements on (1) formula feed development, (2) diagnose and treatment of productive disorder (male and female buffalo) and (3) calf salvation, which are the most unique activities by the PSLD. Having verified such technologies, the Project has recently started collaboration with other stakeholders like Master Agro Industries for formula feed development and provision and NGO HANDS for calf salvation.

(Q&A)

- (Dr. Urs, Master Agro) Why don't you use milk replacer for calf salvation activity to reduce high rearing cost since 60% of the cost is due to use of fresh milk?
  - (Dr. Tominaga, JICA Team) The Project has already tried 3 types of milk replacer, produced in U.K, France and Japan. With such milk replacers, lots of diarrhea cases have been observed although the cost has been reduced to 35 or 40%.
- (Dr. Hafeez, P&D) What are the examples of appropriate technologies? What are the differences observed after four years of Project activities?
  - (Dr. Jiskani, C/P) 50 appropriate technologies and 32 basic useful technologies have been developed. For farm management, farmers are advised to include their labor costs for calculation of production costs. For marketing, we have developed collaboration among farmers so that they can provide sizable milk with good price. For feeding management, things like supply of clean and sufficient water, tying methods, use of spacious shed, proper calf management after birth, health management, improvement of roof have been advised under our Technology Checklist.
- (Dr. Aijaz, ASLP Project) What is the average age of maturity after 3 years of your activities on reproduction?
  - (Dr. Ali, C/P) The average age of maturity is 16 to 18 months.
- (Mr. Okumura, JICA) It is good that calf salvation activity is replicated by another organization. Could you explain about NGO HAND's mandate? How and where do they work?
  - (Mr. Abdul, HANDS) Our organization, 37 years since established, is supporting villagers in 84 villages in 47 districts in the whole Pakistan, out of which 16 are from the Sindh Province. We have our head office in Karachi. We obtained technical guidance from JICA Project and are planning to distribute calves to our model villages in Thatta, TMK, S. Benezirabad, Mirpurkhas, Umerkot, Matiari[1], etc.

7. Livestock extension by Female Extension Workers – Challenges, Advantages and Disadvantages

Dr. Aneesa Soomro, C/P Extension, Team Leader of Extension Team, shared the outline, advantages and disadvantages about dissemination of livestock technologies as a female extension worker, which is one of the first ever attempts for the Department. One of the disadvantages, that is the mobility of female extension workers affected by drivers, can be controlled by the Project side, but there are some challenges; for example, female

[1] Initially it was decided that calves are distributed to Sajawal district.

farmers cannot attend trainings without permission from their husbands, for which extension workers sometimes face difficulties to improve.

(Q&A)

- (Dr. Aijaz, ASLP Project) Why do you not apply the whole family extension approach to include all the family members including children?
  - (Ms. Kawamoto, JICA Team) Before starting extension activity, we have conducted PRA and observed the actual responsibilities between family members, and decided that we would work only on men and women since our target was quite huge. However, our trainings are open to children as well. We will allow them to stay in trainings if they wish.
- (Mr. Okumura, JICA Pakistan) Since the Project is going to end soon, it is now important to look at the numbers of people who have adopted appropriate technologies.
  - (Dr. Umrani, P/M) Few days ago we visited 4 villages through our evaluation trip, where we observed farmers had already started adoption of the technologies. We will surely produce the positive outcomes by the end of the Project.
  - (Ms. Kawamoto, JICA Team) Extension Team has also observed such adoptions by farmers. By the end of next September, we will apply questionnaires as well as observation sheet to calculate how many farmers have adopted the technologies. Results will be shared to you after completion of the questionnaires.
- (Dr. Khalid, ZTBL) How far will the Project be successful? Have you been using modern technologies like media? Will this contribute to raise ownership of women or gender empowerment?
  - (Dr. Umrani, P/M) The Project is aimed at establishment of foundation for livestock sector development. As for technology development, which is one of the four major components of the Project, we have seen that 4 of our pilot farmers along with 19 of their neighbor farmers have started to purchase formula feed from Masterfeeds. We are yet to summarize such results but lots of technologies are now starting to be adopted by farmers.
  - (Ms. Kawamoto, JICA Team) For female E/W, they are talented, but they used to have limited job opportunities but now they have chances to use their full capacities under our Project. That is one aspect of gender empowerment in this Project. For female farmers, we sometimes face village customs or cultures and they refuse to accept our trainings for women. We are not fighting but just proposing them to join trainings. I'd like to point out that women empowerment will not happen without understanding of men.

8. Views of the Participants

The participants shared their views about today's presentations from the Project. The summary of the opinions are as follows.

- (Prof. Soomro, Sindh Agricultural University) The number of beneficiaries are still limited. The results obtained through this Project should be disseminated and adopted by more farmers. The Project is advised to expand and continue extension activity. We are ready to play our role in research or other components. I will request JICA for future cooperation with us.
- (Dr. Zahid Iqbal, SBBUVAS) We can use your extension force for dissemination of knowledge to universities. E/W are welcomed to come and give trainings to the students, which is a better way to

disseminate knowledges between people. Besides, we can make a collaborative project in which students and visitors can see your technologies.

- (Dr. Shahid, International Livestock Research Institute) We are a research based institute that has recently opened our office in Hyderabad. We also run a donor-funded project to increase incomes of livestock farmers in districts that are not covered by PSLD, e.g., Tharparkar, Thatta, N. Feroze, Larkana, Sukkur, etc. We would like to disseminate your knowledges, get supports from your C/P, and work together for the development of Sindh livestock sector between different donor projects.
- (Mr. Umrani, HANDS) We appreciate good supports and trainings from JICA and the Livestock Department. We can replicate this calf salvation activities in our 84 villages.
- (Dr. Urs, Master Agro Industries) We are a Karachi-based company mainly providing poultry feed. We have started provision of dairy feed in 2014 and provision of formula feed in collaboration with JICA Project in 2017. I am thankful for JICA Project to have given us an opportunity to serve the livestock sector.
- (Mr. Khalid, ZTBL) In the dairy field our bank is giving small loans on milk chilling plan. We also provide soft loan called 'Zarai Scheme' to farmers so that farmers can collaborate each other. Since we are targeting the same small scale farmers, we will have a chance to collaborate in future.
- (Mr. Hyder, Cattle Colony) The Livestock Department has not been supporting us well. The Department should target small scale farmers who have 20 to 30 animals, and focus more on reproduction issues, milk marketing and provision of good quality of feed or concentrate. I appreciate JICA's efforts on calf and dry buffalo salvation. Please distribute more to poorer people in need so that they can have assets in the end.
  - (Dr. Soomro, D/G) In World Bank's SAGP Project, for which I am a Project Director, we are trying to install milk chillers in 25 to 30 communities all over the Province. We also help farmers in TMK and Badin to purchase silage machines by financing 70% of the total price. We have good quality of buffalo semen in Karachi. I recommend JICA to utilize this data. Many trainings have been provided by JICA Project, but I request that trainings will be provided in Sindhi language as well. We will soon produce FMD vaccines to be given to farmers in a laboratory established at CVDL.
- (Dr. Aijaz, ASLP) We have no suggestions against your shining star-like efforts. Every year improvement has been observed. This year the Project is joined by female E/W and you have further improved.
- (Dr. Hafeeds, P&D) I appreciate your efforts in 5 pilot districts and it would be better if the same thing can be replicated in other districts. I remember there were series of project plans in your M/P Study, but they are yet to be realized. I would again request the Livestock Department to submit project proposals according to the M/P Study since they will surely serve development of livestock sector in the Sindh Province.

9. Vote of Thanks

Upon closing the meeting, Dr. Ghulum Sarwar Shaikh, General Coordinator, JICA Team, appreciated contributions from all the participants representing different stakeholders of the Livestock Department, universities, NGOs, farmers, private sectors, farmers, etc.

End.

Attachment 1 Meeting Agenda

The Project on Sustainable Livestock Development for Rural Sindh

AGENDA

Fourth Annual Meeting of
Livestock Development Platform
Tuesday, December 12, 2017
Indus Hotel, Hyderabad

The Project on Sustainable Livestock Development for Rural Sindh (PSLD) would like to invite major stakeholders of the livestock sector in Sindh to this livestock development platform meeting.
The main purpose of this meeting is to facilitate the discussion among the stakeholders on the direction of the livestock sector development in Sindh and the roles and responsibilities which each of them is expected to carry.
After the presentation by the project team on the project plan and progress, we would like to ask the participants for the feedbacks particularly on the follow points:

1. Your views on how the project could contribute more on the livestock sector development in Sindh
2. What roles and responsibilities you have for the further development of the livestock sector
3. How practically you or your organization and the Project can collaborate

At the end of the meeting, we expect that the participants have a consensus on the next actions necessary for the livestock sector development in Sindh.

Attachment 2 Meeting Program

The Project on Sustainable Livestock Development for Rural Sindh (PSLD)

PROGRAMME

Fourth Annual Meeting of
Livestock Development Platform
Tuesday, December 12, 2017
Indus Hotel, Hyderabad

Time	Activities	Resource person
9:30-10:00	Guest registration	Project Staff
10:00	Recitation from Holy Quran	Project Counterpart, Dr. Muhammad Arif Khan
10:05	Welcome address	Director General Livestock Sindh/Project Coordinator Dr. Ali Akbar Soomro
10:10	Implication of PSLD for the Development of Livestock Sector in Sindh	Team Leader, JICA Project Team Mr. Hiroshi Okabe,
10:40	Presentation on the Project progress and achievements till date	Project Manager, PSLD Dr. Aslam Pervez Umrani,
11:00	**Tea break**	
11:20	Highlights of livestock technology development 2017 – Buffalo calf salvation and Fodder Development	Project counterparts
11:50	Question & Answers	Facilitator, General Coordinator of JICA Project Team, Dr. Ghulam Sarwar Shaikh
12:10	Livestock extension by Female Extension Workers – Challenges, advantages and dis-advantages	Team Leader Extension, Dr. Aneesa Soomro
12:40	Question & Answers	Facilitator General Coordinator of JICA Project Team, Dr. Ghulam Sarwar Shaikh
13:00	**Lunch & Prayer break**	
13:40	Views of the participants:University, NGOs, Private Sector (marketing), Donor Projects Progressive Farmers Livestock holders in Cattle colony/Farmer	Representation from each segment appreciated
14:10	Next actions - For the development of livestock sector in Sindh	Facilitator Dr. Ghulam Sarwar Shaikh
14:30	Policy remarks	Secretary, Govt. of Sindh, Livestock & Fisheries Department Syed Sohail Akbar Shah
14:50	Vote of thanks	Project Manager PSLD, Dr. Aslam Pervez Umrani,
15:00	**Evening tea**	

Attachment 3 Participants List

#	Name of Participants	Designation/Expertise
Livestock Department		
1	Dr. Ali Akbar Soomro	Director General / Project Coordinator
2	Dr. Jameel Ahmed Shaikh	Executive Director Animal Breeding
3	Dr. Abdul Hamid Lashari	Director Animal Breeding
4	Mr. Muhammad Ayub Bhagat	Director Planning and Monitoring
5	Dr. Durdana Junejo Rao	Additional Director Poultry Production
6	Dr. Zakhir Hussain Subahpoto	Deputy Director Tando Muhammad Khan
7	Dr. Ghulum Rasool Jatoi	Deputy Director Hyderabad
8	Dr. Kewal Ram	Deputy Director Badin
9	Dr. Lal Bux Watto	Deputy Director Matiari
10	Dr. Maqsood Ahmed	Deputy Director Tando Allahyar
11	Dr. Parkash Dewani	Senior Research Officer, CVDL, Tando Jam
12	Dr. Noor-un-Nisa Mari	Technical Officer, DG Office
JICA Office		
13	Mr. Ken Okumura	Representative, JICA Pakistan Office
Sindh Government		
14	Dr. Hafeez-u-Rehman Kaihoro	Assistant Chief Livestock & Fisheries, P&D Department
15	Dr. M. Moora Kamla	Director, Agricultural Extension Department
University		
16	Dr. Noor Muhammad Soomro	Dean, Faculty of Animal Husbandry & Veterinary Sciences Sindh Agriculture University, Tando Jam
17	Dr. Zahid Iqbal Rajput	Dean, Faculty of Veterinary Service, Shaheed Benazir Bhutto University of Veterinary & Animal Sciences, Sakrand
Progressive Farmer		
18	Mr. Hyder Bux Chalgari	Dairy Farmer, New Cattle Colony, Hyderabad
Donor Project		
19	Dr. Shahid Ali Khan	Project Coordinator, ILRI
20	Dr. Aijaz Kumbher	ASLP (Agricultural Sector Linkages Project)
NGO		
21	Mr. Abdul Razaq Umrani	HANDS, Karachi
22	Dr. Ghulam Mustafa Mari	HANDS, Karachi
Private Sector		
23	Dr. Muhammad Urs	Technical & Sales Manager, Master Agro Industries Karachi
24	Mr. Khalid	Zarai Tarqiati Bank Limited, Hyderabad
25	Mr. Faqeer Muhammad	Zarai Tarqiati Bank Limited, Hyderabad

#	Name of Participants	Designation/Expertise
Livestock Department (Counterparts)		
26	Dr. Aslam Pervez Umrani	Project Manager
27	Dr. Aziz Ahmed Palejo	Deputy Project Manager
28	Dr. Muhammad Ibrahim Shaih	Project Manager Assistant
29	Dr. Ghulam Muhammad Jiskani	Farm Management Specialist
30	Dr. Safdar Ali Fazlani	Feeding Management Specialist
31	Dr. Mubarak Jatoi	Livestock Genetics Specialist
32	Dr. Zulfiqar Pathan	Animals Health Specialist
33	Dr. Muhammad Arif	Fodder Specialist
34	Dr. Iqtadar Ali Memon	Marketing Specialist
35	Dr. Rukhsana Vighio	Training Specialist
36	Dr. Ali Akhtar Shahani	Animal Reproduction Specialist
37	Dr. Naeem Siddique Ansari	Animal Assets Specialist
38	Dr. Anisa Soomro	Gender Specialist
39	Dr. Farzana Sarki	Social Mobilization Specialist
40	Dr. Farooq Ahmed Memon	Master Trainer Matiari
41	Dr. Kabeer Ali	Master Trainer Badin
42	Dr. Iqbal Memon	Master Trainer Tando Muhammad Khan
43	Dr. Muhammad Mubeen	Master Trainer Hyderabad
44	Dr. Bibi Ghulam Zuhra	Female Extension Worker Hyderabad
45	Dr. Naimat Khatoon	Female Extension Worker Hyderabad
46	Dr. Reema Imran	Female Extension Worker Matiari
47	Dr. Musrat Kumbhar	Female Extension Worker Matiari
48	Dr. Iram Leghari,	Female Extension Worker Tando Allahyar
49	Dr. Sonia Amjad	Female Extension Worker Tando Allahyar
50	Dr. Shereen Memon	Female Extension Worker Tando Muhammad Khan
51	Dr. Raheela Parveen Khohro	Female Extension Worker Tando Muhammad Khan
52	Dr. Uzma Abbas Chttah	Female Extension Worker Badin
53	Mr. Muhammad Sharif	Extension Worker Badin
54	Mr. Zahid Ali Boohar	Extension Worker Badin
55	Mr. Arif Ali Junejo	Extension Worker Hyderabad
56	Mr. Muhammad Ahsan Khan	Extension Worker Hyderabad
57	Mr. Abdul Mannan Rahu	Extension Worker Matiari
58	Mr. Ashfaq Ali	Extension Worker Matiari
59	Mr. Abdul Ghani	Extension Worker Tando Allahyar
60	Mr. Nasarullah	Extension Worker Tando Allahyar
61	Mr. Barkat Ali Shaikh	Extension Worker Tando Muhammad Khan
62	Mr. Mewa Ram	Extension Worker Tando Muhammad Khan

#	Name of Participants	Designation/Expertise
63	Dr. Muhammad Ali	Veterinary Officer, Calf Salvation Center
JICA Team		
64	Mr. Hiroshi Okabe	Team Leader / Institutional Development Expert
65	Mr. Hideo Tominaga	Appropriate Technology Development 1 Expert
66	Mr. Teruo Kawamura	Feeding Management Expert
67	Ms. Noriko Hara	Appropriate Technology Development 2 Expert
68	Ms. Mika Kawamoto	Extension / Gender Expert
69	Mr. Kodai Yugeta	Training Management Expert
70	Dr. Ghulam Sarwar Shaikh	General Coordinator
71	Dr. Rasool Bux Soomro	Technical Coordinator
72	Mr. Asim Shaikh	Administration Coordinator

Attachment 6-4-3 Minutes of the Sixth Steering Committee Meeting

Minutes of Meeting

Title	6th Steering Committee Meeting
Date / Time	13th December 2017, 12:10-14:55
Place	Indus Hotel, Hyderabad
Participants	See the attached Participants List
Agenda	To share the progress of the 4th year's Project activities and discuss main issues
Attachment	1. Meeting Agenda 2. Participant List

1. Recitation from Holy Quran

2. Introduction of the Participants

3. Welcome Address

Dr. Aslam Pervez Umrani, Project Manager, welcomed the participants upon opening the meeting.

4. Explanation of the Meeting Purpose and Agenda / Project Design Matrix, Project Plan and Goal

Mr. Hiroshi Okabe, Team Leader, JICA Project Team, explained the basics of the Project Design Matrix (PDM), and the Project plan and goals accordingly. He insisted that there are some remaining issues to be considered for the sustainability of the Project. Following this, he explained the outlines of today's meeting, that is to share progress and issues of each of the 4 Project Outputs.

5. Project Targets and Achievements on Technology Development

Dr. Ghulum Muhammad Jiskani, C/P Farm Management, shared the targets and achievements until the 4th year and plans of the 5th year for technology development and buffalo salvation activities (Output 1 and 2).

6. Project Targets and Achievements on Extension

Dr. Aneesa Soomro, C/P Gender, Team Leader, Extension Team, shared the targets and achievements until the 4th year and plans of the 5th year for extension activities (Output 3).

7. Project Targets and Achievements on Strengthening of the Department

Mr. Okabe shared the targets and achievements until the 4th year and plans of the 5th year for institutional development (Output 4). He mentioned that there are goals mentioned in the PDM, and other goals for project sustainability. The latter is that i) "Master Trainers (M/T)" or "Subject-matter Specialists" who have capacities in effective and efficient project management are developed in the Livestock Department, and ii) the new organization structure is established in the Livestock Department to sustainably continue the project activities after JICA's assistance. Regarding the new organization structure, he explained that the Project is now proposing that i) development of a human resource development strategy, ii) capacity building unit, iii) new extension structure, and iv) new planning, monitoring, and evaluation structure.

8. Discussion / Approval – Extension Structure in Future

Ms. Mika Kawamoto, Extension / Gender Expert, JICA Team, made a presentation about the proposed extension structure of the Department, which would be needed to continue extension activities after the Project period. She explained that through 1 day workshop and 5 day training the Department officers have selected Option 4, which is to have a new post of D/G Extension and a new Directorate of Extension under it, among 5

options.

The following is the comments from the participants:

(Discussion)

- (Mr. Memon, P&D Dept.) There were several attempts to establish a separate extension wing in other departments, but they did not look sound. Extension structure should be closely related with research units since its role is to transfer findings from research to farmers.
- (Dr. Muzafer, Livestock Dept.) It is appropriate to have a separate directorate for extension activity. JICA has been working here for the past 4 years and gathered lots of data. Such data can be utilized only under a separate structure since all the other directorates in the Department do not have the same experience. Every single outcome from JICA Project should be left in a newly established office.
- (Dr. Umrani, P/M) The Project will go to the non-development scheme after completion. But I remember that 2018 is a year when most of the Department's animal health-oriented officers will have pressure to achieve international goals so they will be occupied. It is not pragmatic to mix up their responsibilities.
- (Dr. Kewal, D/D Badin) Existing Department staff is already engaged in many projects. We are in short of available staff. We need to recruit new staff.
- (Mr. Memon, P&D Dept.) The official rule usually applied when we transfer the schemes is to create positions, make them approved by a public authority and go through the official recruitment process. Usually in the last forum of the projects, such recommendations and findings are put into MOU.
- (Dr. Shahani, C/P Animal Reproduction) Extension is a bridge between research and field. We used to focus only on veterinary services. But our Project has made a positive impact on awareness of farmers and adoption of technologies. The Department should continue this to increase milk production of farmers.

9. Project Performance – Views of the JICA Office Islamabad

Mr. Ken Okumura, Representative, JICA Pakistan Office, appreciated the efforts of the Departments of Livestock and P&D for solving most of the issues that had been pointed out by the Mid-Term Review Mission although few issues remained unresolved. In this regard, Mr. Okumura conveyed the following 2 messages from JICA Headquarters.

(1) Disbursement of project allowance to the C/P staff and salary to newly recruited Project staff under the revised PC-1 is still delayed, which would affect motivation of the Project staff and Project activities. JICA would like to ask the Department for early settlement of these remaining issues.
(2) The current Project activities should be continued after the Project period so that the outcomes from the Project can be disseminated even to non-pilot districts in the Sindh Province. Besides, various guidelines and SOPs developed by the Project should be officially acknowledged by the Department. The Department should consider appropriate structure in which extension function works well, and also how to implement human resource development strategy recommended by JICA Experts. JICA would like to request the Livestock Department to make a necessary decision on these matters with necessary dialogue with relevant departments how it would continue the Project activities and realize such structures not later than the time of the Terminal Evaluation, September 2018. Considering the time required for inter-departmental coordination and procedures, time is not left so much.

10. Policy Remarks

Mr. Syed Sohail Akbar Shah, Secretary Livestock and Fisheries, appreciated the efforts of all the people involved for solving most of the issues concerning the revised PC-1. He acknowledged, however, that there were still remaining issues of project allowance to C/P and salary for new Project staff. He also acknowledged that the Department should utilize the Project guidelines and SOPs, and work for planning, monitoring and evaluation (PME) and human resource development strategy.

Since the Project is going to end by February 2019, he requested JICA to extend the Project period by 2 years, or if it is not possible, to launch the second phase of the Project in 10 adjoining districts in addition to the current 5 districts. He also suggested that the Project should focus more on marketing aspects as well as the current technology dissemination activities to increase farmers' incomes and assets.

He suggested that if the idea of establishing a new separate directorate for extension activity is finalized, then still such a structure should be equipped with 'muscle' or properties since the new staff cannot work if isolated without getting a strong support in the Department. He also agreed with Mr. Shahab Memon's ideas regarding extension and new structure; i.e. usually in the last forum of the projects, recommendations and findings of the project are put into MOU.

Regarding the PME structure, he recommended collaboration with National Management Institute in Islamabad and National Institute of Public Administration Karachi, these institutes can provide training to the Department Officers on PME and other desired skills. It was also suggested that the Department start sending the officers to these Institutes for 10 to 15 days of annual mandatory trainings. He also informed that the Livestock Department, like other departments, is going to have an Additional Secretary (Technical) to assist the Secretary and to plan, monitor and foresee the entire Department.

Finally, he concluded his policy remarks by requesting the Project Team to form up its recommendations so that the Department can be consulted for necessary actions to be taken.

11. Vote of Thanks

Dr. Ghulum Sarwar Shaikh, General Coordinator, JICA Team, concluded the meeting by appreciating all the participants' presence in the meeting.

End.

Mr. Syed Sohail Akbar Shah
Secretary Livestock and Fisheries, Government of Sindh

Mr. Ken Okumura
Representative, JICA Pakistan Office

Dr. Aslam Pervez Umrani
Project Manager, PSLD, Department of Livestock

Mr. Hiroshi Okabe
Team Leader, JICA Project Team

Attachment 1 Meeting Agenda

The Project on Sustainable Livestock Development for Rural Sindh (PSLD)

AGENDA

Sixth Project Steering Committee Meeting
Wednesday, December 13, 2017
Indus Hotel, Hyderabad

Time	Activities	Resource person
11:00	Guests to be seated	Project staff
11:05	Recitation from Holy Quran	Project Counterpart, Dr. Muhammad Arif Khan
11:10	Introduction of the participants	General Coordinator of JICA Project Team Dr. Ghulam Sarwar Shaikh
11:20	Welcome Address	Project Manager PSLD, Dr. Aslam Pervez Umrani
11:30	1. Explanation of the Meeting Purpose & Agenda 2. Project Design Matrix (PDM) Project plan and goals	Team leader of JICA Project Team Mr. Hiroshi Okabe
11:50	Project targets and achievements on technology development	Project Counterparts
12:20	Project targets and achievements on extension	Team Leader Extension, Dr. Aneesa Soomro,
12:45	Tea break	
13:00	Project targets and achievements on strengthening of the Department	Team leader of JICA Project Team Mr. Hiroshi Okabe
13:20	Discussion/approval –Extension Structure in future	JICA Extension Expert, Ms. Mika Kawamoto
13:40	Project performance – Views of the JICA Office Islamabad	JICA Country Representative Pakistan Office
13:50	Closing remarks	Secretary, Government of Sindh, Livestock & Fisheries Department Syed Sohail Akbar Shah
14:00	Vote of Thanks	DG Livestock Sindh/Project Coordinator Dr. Ali Akbar Soomro
14:10	Lunch	

Attachment 2 Participants List

#	Name of Participants	Designation/Expertise
Livestock Department		
1	Syed Sohail Akbar Shah	Secretary, Government of Sindh Livestock and Fisheries Department
2	Dr. Abdul Hamid Lashari	Director Animal Breeding Sindh
3	Mr. Muhammad Ayub Bhagat	Director Livestock Planning and Monitoring Sindh
4	Dr. Kirshan	Disease Investigation Officer Sindh Directorate of Animal Husbandry
5	Dr. Zakhir Hussain Subahpoto	Deputy Director Livestock/Animal Husbandry Tando Muhammad Khan
6	Dr. Ghulum Rasool Jatoi	Deputy Director Livestock/Animal Husbandry Hyderabad
7	Dr. Kewal Ram	Deputy Director Livestock/Animal Husbandry Badin
8	Dr. Lal Bux Watto	Deputy Director Livestock/Animal Husbandry Matiari
9	Dr. Maqsood Ahmed	Deputy Director Livestock/Animal Husbandry Tando Allahyar
10	Dr. Parkash Dewani	Senior Research Officer, CVDL, Tando Jam
11	Dr. Muzafer Vighio	Livestock Development Officer Sindh
JICA Office		
12	Mr. Ken Okumura	Representative, JICA Pakistan Office
Sindh Government		
13	Mr. Shahabuddin Memon	Senior Chief Livestock & Fisheries, P&D Department
14	Mr. Atta-u-rehman Mari	Additional Secretary, Agricultural Department
Livestock Department (Counterparts)		
15	Dr. Aslam Pervez Umrani	Project Manager, PSLD for Rural Sindh
16	Dr. Aziz Ahmed Palejo	Deputy Project Manager, PSLD for Rural Sindh
17	Dr. Muhammad Ibrahim Shaih	Assistant Project Manager, PSLD for Rural Sindh
18	Dr. Ghulam Muhammad Jiskani	Farm Management Specialist
19	Dr. Safdar Ali Fazlani	Feeding Management Specialist
20	Dr. Muhammad Mubarak Jatoi	Livestock Genetics Specialist
21	Dr. Zulfiqar Ali Pathan	Animal Health Specialist
22	Dr. Muhammad Arif Khan	Fodder Specialist
23	Dr. Iqtadar Ali Memon	Marketing Specialist
24	Dr. Ali Akhtar Shahani	Animal Reproduction Specialist
25	Dr. Naeem Siddique Ansari	Animal Assets Specialist
26	Dr. Anisa Soomro	Gender Specialist
27	Dr. Farzana Sarki	Social Mobilization Specialist
28	Dr. Farooq Ahmed Memon	Master Trainer Matiari
29	Dr. Kabeer Ali	Master Trainer Badin
30	Dr. Iqbal Memon	Master Trainer Tando Muhammad Khan
31	Dr. Muhammad Mubeen	Master Trainer Hyderabad

JICA Team		
32	Mr. Hiroshi Okabe	Team Leader / Institutional Development Expert
33	Mr. Hideo Tominaga	Appropriate Technology Development 1 Expert
34	Mr. Teruo Kawamura	Feeding Management Expert
35	Ms. Noriko Hara	Appropriate Technology Development 2 Expert
36	Ms. Mika Kawamoto	Extension / Gender Expert
37	Mr. Kodai Yugeta	Training Management Expert
38	Dr. Ghulam Sarwar Shaikh	General Coordinator
39	Dr. Rasool Bux Soomro	Technical Coordinator
40	Mr. Asim Shaikh	Administration Coordinator

Attachment 6-5-1 Minutes of the Seventh Steering Committee Meeting

Minutes of Meeting

Title	7th Steering Committee Meeting
Date / Time	14th May 2018, 12:00-14:30
Place	Indus Hotel, Hyderabad
Participants	See Attachment 2
Agenda	To share and approve the 5th year work plan based on the project goals, progress/achievements, and main issues
Attachment	1. Meeting Agenda 2. List of Participants

1. Recitation from Holy Quran

2. Introduction of the Participants

3. Welcome Address

Dr. Ali Akbar Soomro, Director General Livestock / Project Coordinator, welcomed the participants upon opening the meeting.

4. Explanation of the Meeting Purpose and Agenda / Project Plan and Goals of the 5th Year, Issues on Project Sustainability

Mr. Hiroshi Okabe, Team Leader, JICA Team, explained the overview of the Project, including its background, goals, the progress/achievements of each of the 4 Output activities and remaining issues regarding the project sustainability.

He suggested that (1) development of a human resource development strategy as well as restructuring of the Department, which includes (2) regularization of the Capacity Building Unit (CBU), (3) establishment of extension structure, and (4) establishment of planning, monitoring and evaluation structure, is required for the Department to assure the sustainability of the project activities.

5. Project Target, Achievements, and Issues on Technology Development

Dr. Ghulum Muhammad Jiskani, C/P Farm Management, shared the targets and achievements until the 4th year and plans of the 5th year for technology development and buffalo salvation activities (Output 1 and 2).

He explained that, for Output 1, in the 5th year, the Project will (1) conduct appropriate technology training for Department's veterinary officers (VOs) and stock assistants (SAs), (2) continue verification of appropriate technologies, and (3) conduct training on main basic useful technologies such as animal reproduction, andrology and genetic improvement. Whereas, for Output 2, in the 5th year, the Project will (1) continue a 3-month old calf distribution model, (2) verify a few days old calf distribution model, (3) verify a 1-month old calf salvation model (4), deliver training on calf salvation, and (5) provide technical guidance to stakeholders in the livestock sector. For this, the Project has started publishing a PSLD newsletter and finalizing various PSLD textbooks to share the project achievements among the stakeholders.

6. Project Targets, Achievements, and Issues on Extension

Dr. Aneesa Soomro, C/P Gender, Team Leader, Extension Team, shared the targets and achievements until the 4th year and plans of the 5th year for extension activities (Output 3).

She explained that, in the 5th year, the Extension Team will conduct (1) training, follow-up, and monitoring for core farmers in pilot villages, and (2) training, follow-up and monitoring for farmers and core farmer selection in surrounding villages.

7. Project Targets, Achievements, and Issues on Capacity Building

Dr. Rukhsana Vighio, Chairperson of CBU, shared the targets and achievements until the 4th year and plans of the 5th year for institutional development (Output 4).

She explained that, in the 5th year, the CBU will (1) conduct project management training under the JICA budget, (2) coordinate capacity building training under the Sindh Government budget, (3) coordinate appropriate technology training to VOs and SAs, (4) collect information and facilitate officers' application process for external training, and (5) collect personal proforma and develop the human resource database.

8. Request for Approval on Recovering Heifers and Utilization of Recovered Amount from Selling PSLD Heifer and Partial Payment of a Few Days Calf

Dr. Naeem Siddique Ansari, C/P Animal Assets, explained that 3-year calf distribution contract with farmers is close to end, thereby requesting for approval that the Project will utilize the amount recovered from selling returned heifers for operation of the calf salvation center at the Department. It has been decided that the concerned officers will sit together to make a decision in another occasion.

9. Visit of the Terminal Mission and Roles of GoS

Mr. Okabe informed that JICA headquarters will dispatch the Terminal Evaluation Mission in the coming August/September and asked the Secretary Livestock to nominate 2 suitable officers to jointly work with Japanese evaluation team. He mentioned that the key points of the evaluation are 1) to what extent the Project has achieved its targets, and 2) to what extent the project activities are expected to be continued after the JICA's assistance. In addition, he asked the Secretary to 1) immediately appoint a new Project Manager and review and give the direction to the Project how the restructuring of the Department should be proceeded for the project sustainability according to the consolidated concept paper submitted by the Project to the Secretary in February 2018.

10. Project Performance and Expectations – Views of the JICA Office Islamabad

Ms. Kazuho Ujiie, Representative, JICA Pakistan Office, appreciated the efforts of the related persons on achieving the project progress made so far. She shared the following views of JICA headquarters in respect of achieving the project purpose within the remaining project period and of continuing the project activities after completion of the Project.

(1) JICA would like to ask the Department to continue technical transfer by working further on development and dissemination of appropriate technologies. For this, development of human resources and timely execution of the project budget is strongly requested.

(2) JICA would like to recommend the Department to establish an authority to continue the project activities, that is, establishment of the Directorate of Extension and CBU as a permanent unit as well as strengthening of the monitoring and evaluation structure, so that the project activities can be continued after completion of the Project.

(3) The current Extension Team members, employed on contract basis, need to be recruited on permanent basis after completion of the Project. JICA hears that such a measurement is now being initiated by the Sindh Government, so the necessary follow-up by the Department is needed.

(4) The Project Manager has been absent since last March. JICA would like to ask the Department to

immediately appoint a new Project Manager for smooth operation of the Project.

She requested the Department to share its views and progress on the above-mentioned issues before JICA dispatches terminal evaluation mission from the Headquarters.

11. Closing Remarks

Mr. Baqaullah Unnar, Secretary Livestock and Fisheries, left his closing remarks that this Project, which contributes to the most important and sensitive sector of livestock, should reach not only 3,000 farmers but more farmers despite lack of dedication and impediments to the process at the initial stage of the Project in past. We should learn new technologies from other countries such as Japan.

12. Vote of Thanks

Dr. Ghulum Sarwar Shaikh, General Coordinator, JICA Team, concluded the meeting by appreciating all the participants' presence in the meeting.

End.

Mr. Baqaullah Unnar Secretary Livestock and Fisheries Government of Sindh	Ms. Kazuho Ujiie Representative JICA Pakistan Office
Dr. Ali Akbar Soomro Director General Livestock Department of Livestock and Fisheries / Project Coordinator PSLD	Mr. Hiroshi Okabe Team Leader JICA Project Team

Attachment 1 Meeting Agenda

The Project on Sustainable Livestock Development for Rural Sindh

AGENDA (Original)

Seventh Project Steering Committee Meeting
Monday, May 14, 2017
Indus Hotel, Hyderabad

Time	Activities	Resource person
11:00	Guests to be seated	Project staff
11:05	Recitation from Holy Quran	Project Counterpart, Dr. Muhammad Arif Khan
11:07	Introduction of the participants	General Coordinator of JICA Project Team Dr. Ghulam Sarwar Shaikh
11:15	Welcome Address	DG Livestock Sindh/Project Coordinator Dr. Ali Akbar Soomro
11:20	1. Explanation of the Meeting Purpose & Agenda 2. Project Design Matrix (PDM) , Plan and goals of the 5th year, Issues on project sustainability	Team leader of JICA Project Team Mr. Hiroshi Okabe
11:50	Project targets, achievements and issues on technology development	Project Counterparts
12:20	Project targets, achievements and issues on extension	Team Leader Extension, Dr. Aneesa Soomro,
12:45	Tea break	
13:00	Discussion on the consolidated concept paper – Progress so far	Facilitated by General Coordinator of JICA Project Team Dr. Ghulam Sarwar Shaikh
13:30	Visit of the Terminal mission and roles of GoS	Team leader of JICA Project Team Mr. Hiroshi Okabe
13:45	Project performances and expectations – Views of the JICA Office Islamabad	JICA Country Representative Pakistan Office
13:55	Closing remarks	Secretary, Government of Sindh, Livestock & Fisheries Department Mr. Baqaullah Unar
14:05	Vote of Thanks	DG Livestock Sindh/Project Coordinator Dr. Ali Akbar Soomro
14:10	Lunch	

Attachment 2 List of Participants

#	Name of Participants	Designation/Expertise
Livestock Department		
1	Mr. Baqaullah Unnar	Secretary Livestock and Fisheries
2	Dr. Ali Akbar Soomro	Director General / Project Coordinator
3	Dr. Abdul Qadir Junejo	Executive Director Poultry Production
4	Dr. Jamil Ahmed Shaikh	Executive Director Animal Breeding
5	Mr. Muhammad Ayub Bhagat	Director Planning and Monitoring
6	Dr. Kahir Muhammad Khaskheli	Director Poultry Production
7	Dr. Parkash Dewani	Director Veterinary Research and Diagnosis
8	Dr. Muzafer Vighio	Director Livestock Extension
9	Dr. Ghulum Sarwar Dero	Deputy Director Livestock Animal Husbandry Hyderabad
10	Dr. Jai Kumar	Deputy Director Livestock Animal Husbandry, Matiari
11	Dr. Noor-un-Nisa Mari	Technical Officer, DG Office
JICA Office		
12	Ms. Kazuho Ujiie	Representative, JICA Pakistan Office
13	Mr. Amir A. Bukhari	Senior Program Officer, JICA Pakistan Office
Sindh Government		
14	Dr. Hafeez-u-Rehman Kaihoro	Assistant Chief Livestock & Fisheries, P&D Department
Farmer		
15	Syed Ali Hyder Shah	Breeders Association
16	Mr. Muhammad Aamir	OCC, Commercial Farmer
17	Mr. Faqeero Kolhi	Pilot Farmer, Tando Muhammad Khan
18	Mr. Waleed Mangwano	Pilot Farmer, Hyderabad
19	Mr. Pehlaj Kolhi	Pilot Farmer, Hyderabad
20	Mr. Mustaque Bozdar	Pilot Farmer, Tando Allahyar
21	Mr. Sultan Lashari	Pilot Farmer, Tando Allahyar
Livestock Department (Counterparts)		
22	Dr. Aziz Ahmed Palejo	Deputy Project Manager
23	Dr. Ghulam Muhammad Jiskani	Farm Management Specialist
24	Dr. Safdar Ali Fazlani	Feeding Management Specialist
25	Dr. Mubarak Jatoi	Livestock Genetics Specialist
26	Dr. Zulfiqar Pathan	Animals Health Specialist
27	Dr. Muhammad Arif	Fodder Specialist
28	Dr. Iqtadar Ali Memon	Marketing Specialist
29	Dr. Ali Akhtar Shahani	Animal Reproduction Specialist
30	Dr. Naeem Siddique Ansari	Animal Assets Specialist
31	Dr. Rukhsana Vighio	Training Specialist / CBU Chairperson

#	Name of Participants	Designation/Expertise
32	Dr. Anisa Soomro	Gender Specialist
33	Dr. Muhammad Ibrahim Shaih	CBU Member
34	Dr. Muhammad Ali Brohi	Veterinary Officer, Calf Salvation Center
35	Dr. Farooq Ahmed Memon	Master Trainer Matiari
36	Dr. Kabeer Ali	Master Trainer Badin
37	Dr. Iqbal Memon	Master Trainer Tando Muhammad Khan
38	Dr. Muhammad Mubeen	Master Trainer Hyderabad
39	Mr. Abdul Ghani	Extension Worker, Tando Allahyar
JICA Team		
40	Mr. Hiroshi Okabe	Team Leader / Institutional Development Expert
41	Ms. Mika Kawamoto	Extension / Gender Expert
42	Mr. Kodai Yugeta	Training Management Expert
43	Dr. Ghulam Sarwar Shaikh	General Coordinator
44	Dr. Rasool Bux Soomro	Technical Coordinator (1)
45	Mr. Asim Shaikh	Administration Coordinator
46	Ms. Zahida Soomro	Technical Coordinator (2)

Attachment 6-5-2 Minutes of the Eighth Steering Committee Meeting

Minutes of Meeting

Title	8th Steering Committee Meeting
Date / Time	6th September 2018, 10:00-13:00
Place	Indus Hotel, Hyderabad
Participants	See Attachment 2
Agenda	To share the results of Joint terminal evaluation
Attachment	1. Meeting Agenda 2. List of Participants 3. Presentation materials

1. Recitation from Holy Quran

2. Introduction of the Participants

3. Welcome Address

Dr. Ali Akbar Soomro, Director General Livestock / Project Coordinator, welcomed the participants upon opening the meeting.

4. Explanation of the Meeting Purpose and Agenda

Mr. Hiroshi Okabe, Team Leader, JICA Team, explained two main objectives of the meeting. One is to share the results of the evaluation on achievement of the Project. Another one is to discuss on sustainability of the Project activities. Sustainability of the Project should be pursued by the Livestock Department if the Department sees the value of the outcome of the Project. He requested the participants to discuss and conclude in writing on countermeasures against the recommendations from the evaluation team so that it may become clear to everybody what to do and who is responsible after the meeting.

5. Result of the Joint Evaluation / Evaluation results with 5 criteria

Mr. Atsushi Suzuki, Consultant, JICA evaluation mission presented the evaluation results with 5 criteria, namely, relevance, effectiveness, efficiency, impact and sustainability. The achievement level of outputs and project purpose is moderate to moderately high. Relevance is high. Effectiveness is moderately high. Efficiency, impact and sustainability are moderate.

6. Result of the Joint Evaluation / Conclusion and Recommendation

Dr. Tomoko Taira, Team Leader, JICA evaluation mission presented the conclusion and recommendations. She concluded that while most of project purposes were achieved, some are yet to be achieved due to delay of activities. The Project, therefore, needs to be extended one more year. However, the activities are expected to be carried out by the Livestock Department. The role of the Japanese experts in the extension period would be limited to monitoring, follow-up and advise.

She emphasized that for the seamless implementation of the extended project, the request of PC-I extension needs to be completed by March 2019 and approved by June 2019. Further, for regularization of the Project activities, PC-IV should be submitted by December 2019 and the regular budget should be ensured by June 2020.

She, then, presented the recommendations of the evaluation mission; 1) to the Project, 2) to the Livestock

Department, and 3) to Planning and Development Department as mentioned in the attached presentation materials.

Six recommendations were made to the Project regarding the activities for 1) Ouptut1, 2) Output 2, 3) Output 3, 4) Output 4, and 5) Publicity activities, and 6) Revision of PDM indicators. As for revision of PDM indicators, the Project was requested to modify some indicators and get approval at the next steering committee.

Nine recommendations for the Livestock Department and three recommendations to Planning and Development Department were made.

Lastly, she explained that the lesson learnt for the similar-type of projects was that the involvement of private sector would ensure the sustainability of the projects.

(Discussion)

- (Dr. Hafeez-ur-Rehman Kalhoro, P&D Department) He mentioned that since the project period has been already extended for one year i-e from June 2018 to June 2019, P&D recommends that project activities shall be completed by June 2019 and the PC-IV shall be submitted. However, it depends on the Livestock Department whether go for PC-I extension or apply for PC-IV. For the extension of PC-I, it has to be approved by the CDWP at federal level if it is foreign funded project.

7. Remarks by the Secretary

Mr. Sohail Akbar Shah, Secretary, Livestock & Fisheries Department mentioned that he was glad to listen the achievements of the Project. He expressed gratitude to JICA and the project team and highly appreciated their efforts.

In response to the recommendations made by the evaluation team, he made his remarks as follows;

- Restructuring of the Department: He made detailed discussion with Mr. Okabe, Team Leader of the Project about the restructuring of the Department when he was the Secretary Livestock & Fisheries Department last year. He has agreed with the Project proposal and assumes that it has been already proceeded it to the Government. He will see where it is now if so.
- Extension of PC-I and application of PC-IV: He committed that the Livestock Department will make efforts to convince P&D Department for the extension of PC-I for one more year i-e June 2020 and then application of PC-IV.
- Appointment of the Project Manager: The newly elected government is strict in observing rules and regulation. Additional charges to government officers are no more accepted and also the lower pay scale officers are not allowed to be posted on the higher grade posts, hence the proposal of Dr. Muzafer Ali Vighio, an officer of BPS-19 has not been approved for posting as the PM (BPS-20).. Due to this, the Project Manager now has to be recruited from the market.
- Extension activities by the Directorate of Animal Husbandry and Breeding activities by the Directorate of Animal Breeding: Executive order will be notified by the Secretary to take over extension activities by the Directorates of Animal Husbandry and Animal Breeding respectively
- Creation of revolving fund account: The Secretary committed to get approval from the Finance Department to open the revolving fund account for calf salvation.
- Subsidy, Loan for calf salvation: He mentioned that all these facilities are already available. We just need to facilitate and link farmers with these facilities. Moreover, there is a Sindh Board of Investment (BOI) under the Government of Sindh that supports farmers to get loans from various financial institutions. Farmers may develop small proposal for the purpose and submit to the Board for consideration and support. Secretary Livestock is also a member of the BOI, whose members can be invited to the platform meeting.

(After his remarks, he left the venue due to the other engagement at the District Nawab Shah.)

8. Discussion in details for the implementation of the recommendation

Mr. Okabe, Team leader of the JICA Project Team and Dr. Ghulam Sarwar Shaikh, General Coordinator, JICA Project Team facilitated the detail discussion on the recommendations made by the Evaluation Team.

(Discussion & Decisions)

[To the Project]

- Recommendation for Output 1, 2, 3 and 4 will be continuously carried out by the Project Team by the end of January 2019, and then by the initiative of the Livestock Department with advice and guidance of the JICA experts during the extension period.
- (5) Publicity activities: The Livestock Department will appoint a responsible person from any Directorate for the Department's website management and other publicity activities by issuing notification letter.
- (6) Modification of indicators: The JICA project team will modify some indicators, discuss with the Department, and obtain approval at the next SC.
- (Mr. Bukhari, JICA Pakistan office) He asked who will be leading these publicity activities in the Department.
- (The Livestock Department) All the participants of the Department agreed that Deputy Project Manager will be responsible to lead all these activities.

[To the Livestock Department]

- (1) Appointment of PM: The Livestock Department shall complete recruitment of the new PM within 60 days.
- （Taira） We have requested JICA Pakistan Office to monitor the progress of new PM recruitment and share it with JICA HQ.
- (2) Smooth approval of disbursement of PC-I budget: Draft Release Order (DRO) for Jul – Dec has already submitted to the Secretary. Since the Secretary already committed in his remarks, this will be soon approved. After the approval of the Secretary, DRO needs to be approved by the Finance Department. DPM should pursue all these process from his end to get DRO through.
- (3) Extension of PC-I: Once first quarter of budget is released, then, the application process of PC-I extension shall be started. For applying extension, information including expenditure sheets, utilization of budgets, savings and justification of extension are required. The extension of project period proposal shall be developed by the PM/DPM under the supervision of Project Coordinator (DG Livestock).
- (4) Restructuring of the Department : It was confirmed that Dr. Abdul Qadir Junejo, Executive Director, Poultry was appointed as the chairman of the committee to discuss the proposal with the Key Officers of the Department and submit the final proposal to the Secretary Livestock for further necessary action. He will continue to work with the other members for this task
- (5) Extension activities by the Directorate of Animal Husbandry: The Secretary will soon issue an executive order to engage VOs and SAs under Directorate of Animal Husbandry to work for extension activities, and Directorate of Animal Breeding for breeding activities
- (Mr. Okabe) Are there enough staff to work for extension activities currently at the district offices?
- (Dr. Abdul Qadir Junejo) There will be no shortage of staff. Additional 140 VOs will soon be recruited. There are additional posts of 200 SAs and 200 supporting staff.
- (Mr. Bukhari) DG should issue a letter to assign the trained VOs and SAs to engage in extension activities.
- (Sarwar) It would be better that the district offices nominate appropriate VOs and SAs, and DG will notify them. The pilot districts should prepare the name list within 5 days.

- (Mr. Okabe) The Project already trained and identified 15 Master trainers in social mobilization and project management. These master trainers in social mobilization are better to be engaged with extension activities. As for SA, those who are interested in extension activities should be nominated. CBU has the list of the master trainers. All the Additional Directors and Deputy Directors Livestock/Animal Husbandry from the project pilot districts agreed to take over this responsibility.
- (6) Notify & Implement SOPs and guidelines: The Project shall issue a request letter to the DG for notification of SOPs and guidelines by referring the recommendations of the Evaluation Team, and then it will be notified as an official procedures and guidelines to be observed by the Department.
- (7) Revolving fund: The process of opening revolving fund is in progress. Currently the Livestock Department is waiting for the approval of second signatory from the Additional Chief Secretary Livestock.
- (Mr. Okabe) Can we assign a C/P as one of the signatories for smooth operation of funds?
- (DG) Ex-PM recommended to have two signatories of DG and PM.
- (Dr. Sarwar) The Project shall develop proper TOR for the specific use of the funds and request the Department to nominate other signatories who are directly involved in the activities.
- (8) Publicity Activities: There is a Publicity Officer in Directorate of Animal Breeding . His role should be reactivated. The Secretary should nominate a responsible officer for this task from Directorate of Animal Husbandry also
- (9) Subsidy, Loan: The Project can invite BOI and other relevant stakeholders to the platform meeting.

[To Planning and Development Department]

- Three recommendation points were already discussed in the previous discussion.

9. Closing remarks

Dr. Parkash Dewani, Leader of Joint Evaluation Team (Pakistan) shared that through the evaluation process, he found the Project was concluding with great success, which was different from the other projects he experienced before. The tasks given to the Livestock Department is challenging. Nevertheless, unless fulfilling these tasks, the sustainability will be questioned. He expressed gratitude to Japanese Government, mission members and the Project Team.

10. Vote of Thanks

Dr. Ali Akbar Soomro, Director General concluded the meeting by appreciating all the participants' presence in the meeting.

End.

Attachment 1 Meeting Agenda

The Project on Sustainable Livestock Development for Rural Sindh

AGENDA

Eighth Steering Committee Meeting
(Joint Evaluation Meeting)
Thursday 6, 2018
Indus Hotel, Hyderabad

Time	Activities	Resource person
10:00	Guests to be seated	Project staff
10:05	Recitation from Holy Quran	Project Counterpart, Dr. Muhammad Arif Khan
10:07	Introduction of the participants	Facilitated by General Coordinator of JICA Project Team Dr. Ghulam Sarwar Shaikh
10:15	Welcome Address	DG Livestock Sindh/Project Coordinator Dr. Ali Akbar Soomro
10:20	Explanation of the Meeting Purpose & Agenda	Team leader of JICA Project Team Mr. Hiroshi Okabe
10:25	Results of the Joint Evaluation 1. Evaluation results with 5 criteria	Consultant, JICA mission Mr. Atsushi Suzuki
10:40	2. Conclusion 3. Recommendations	JICA mission leader Dr. Tomoko Taira
11:00	Clarification	Facilitated by General Coordinator of JICA Project Team Dr. Ghulam Sarwar Shaikh
11:15	Remarks	Secretary, Government of Sindh, Livestock & Fisheries Department Mr. Sohail Akbar Shah
11:30	Tea break	
11:45	Discussion in details for the implementation of the recommendations	Facilitated by General Coordinator of JICA Project Team Dr. Ghulam Sarwar Shaikh
12:30	Closing remarks	Dr. Parkash Dewani Leader of Joint Evaluation Team (Pakistan)
12:35	Vote of Thanks	DG Livestock Sindh/Project Coordinator Dr. Ali Akbar Soomro
12:40	Lunch	

Attachment 2 List of Participants

#	Name of Participants	Designation/Expertise
Livestock Department		
1	Mr. Syed Sohail Akbar Shah	Secretary Livestock and Fisheries
2	Dr. Ali Akbar Soomro	Director General, Livestock Sindh, Hyderabad
3	Dr. Jamil Ahmed Shaikh	Executive Director, Animal Breeding Sindh, Hyderabad
4	Dr. Siraj Ahmed Isani	Executive Director, Animal Husbandry Sindh Hyderabad
5	Dr. Abdul Qadir Junejo	Executive Director, Poultry Sindh, Karachi
6	Dr. Abdul Latif Memon	Additional Director Livestock/Animal Husbandry Hyderabad
7	Dr. Sikander Ali Panhwar	Additional Director Poultry Mirpurkhas
8	Dr. Toquir ur Rehman	Additional Director Animal Husbandry, Jamshoro
9	Dr. Zakir Hussain	Additional Director Animal Husbandry Tando Muhammad Khan
10	Dr. Abdul Karim Memon	Additional Director, Animal Husbandry Matiari
11	Dr. Ghulam Rasool Jatoi	Additional Director, Animal Husbandry Nawab Shah
12	Dr. Durdana Junaid Rao	Additional Director, PP&R Hyderabad
13	Dr. Zulfiqar Ali Bhutto	Deputy Director Livestock Development Kohistan @ Thano Bola Khan
14	Dr. Mohammad Rahim Khaskeli	Deputy Director Livestock/Animal Husbandry Tando Muhammad Khan
15	Dr. Kewal Ram Asudani	Deputy Director Livestock/Animal Husbandry Badin
16	Dr. Jai Khumar Sonaro	Deputy Director Livestock/Animal Husbandry Matiari
17	Dr. Mazhar Ali Rind	Deputy Director Livestock/Animal Husbandry Tando Allahyar
18	Dr. Ghulam Sarwar Dero	Deputy Director Livestock/Animal Husbandry Hyderabad
19	Dr. Shah Murad Brohi	Disease Investigation Officer, Animal Husbandry Sindh Hyderabad
20	Dr. Noor un Nisa Mari	Dairy Dev. Officer @ Directorate General Livestock, Hyderabad
21	Dr. Abdullah Sethar	Deputy Director, Animal Breeding Sindh Hyderabad
22	Dr. Syed Sabir Ali Shah	Deputy Director Livestock/Animal Husbandry Jamshoro
Planning and Development Department		
23	Dr. Hafeez ur Rehman Kalhoro	Planning and Development Dept.
Evaluation Team		
24	Dr. Tomoko Taira	Director, Team 1, Group 1, Rural Development Department, JICA
25	Ms. Chisa Togo	Assistant Director, Team 1, Group 1, Rural Development Department, JICA
26	Dr. Masaharu Kanameda	Senior Advisor, Rural Development Department, JICA
27	Mr. Atsushi Suzuki	Senior Consultant, A&M Consultant Co., Ltd.
28	Dr. Parkash Dewani	Director, Veterinary Research & Diagnosis CVDL Sindh Tando Jam
29	Dr. Muzaffar Ali Vighio	Director, Directorate General Livestock (Ext. & Res.) Hyderabad
JICA office		
30	Ms. Kazuho Ujiie	Representative, JICA Pakistan Office
31	Mr. Amir A. Bukhari	Senior Program Officer, JICA Pakistan Office

#	Name of Participants	Designation/Expertise
32	Ms. Ikumi Ishidate	JICA Pakistan Office
Livestock Department (Counterparts)		
33	Dr. Aziz Ahmed Palejo	Deputy Project Manager, PSLD for Rural Sindh
34	Dr. Ghulam Muhammad Jiskani	Farm Management Specialist
35	Dr. Iqtadar Ali Memon	Marketing Specialist
36	Dr. Ali Akhtar Shahani	Animal Reproduction Specialist
37	Dr. Naeem Siddique Ansari	Animal Assets Specialist
38	Dr. Muhammad Mubarak Jatoi	Livestock Genetics Specialist
39	Dr. Rukhsana Vighio	Training Specialist / Chairperson, CBU
40	Dr. Safdar Ali Fazlani	Feeding Management Specialist
41	Dr. Muhammad Arif Khan	Fodder Specialist
42	Dr. Zulfiqar Ali Pathan	Animal Health Specialist
43	Dr. Anisa Soomro	Gender Specialist
44	Dr. Muhammad Ali	Veterinary Officer, Calf Salvation Center, Hyderabad
JICA Project Team		
45	Mr. Hiroshi Okabe	Team Leader / Institutional Development Expert
46	Mr. Hideo Tominaga	Appropriate Technology Development 1 Expert
47	Ms. Noriko Hara	Appropriate Technology Development 2 Expert
48	Ms. Mika Kawamoto	Extension / Gender Expert
49	Dr. Ghulam Sarwar Shaikh	General Coordinator

Attachment 6-5-3 Minutes of the Ninth Steering Committee Meeting

Minutes of Meeting

Title	9th Steering Committee Meeting
Date / Time	11th October 2018, 14:00-16:30
Place	Marvi Hall, Indus Hotel, Hyderabad
Participants	See Attachment 2
Agenda	To explain, discuss, and reach a consensus on the Work Plan for the extension period To review the plans and progress of actions for recommendations by the Terminal Evaluation Mission (TME).
Attachment	1. Meeting Agenda 2. List of Participants 3. Revised PDM version 3 4. Progress of Actions for Recommendations by TEM

1. Recitation from Holy Quran

2. Introduction of the Participants

3. Welcome Address

Dr. Ali Akbar Soomro, Director General Livestock / Project Coordinator, welcomed the participants upon opening the meeting.

4. Explanation of the Meeting Purpose and Agenda

Mr. Hiroshi Okabe, Team Leader, JICA Team, explained the overview of the Project regarding why we are implementing the Project, the reasons of the Project period extension, and what activities should be done by January 2019 and after February 2019 to June 2020 during which the main responsibilities of the Project implementation will be transferred from JICA to the Department. He also explained the changes made in the PDM ver.3. After the approval of modification of R/D by JICA based on the agreement of the changes of PDM by both Pakistan and Japan sides, it would be PDM ver. 4. He then reviewed each of the 12 suggestions made by the Terminal Evaluation Mission (TEM) and the actions required.

5. Change of PDM

The participants have agreed on the changes of the PDM ver.3, namely two indicators of overall goal and project purpose respectively, as explained by Mr. Okabe. The revised PDM is attached as Attachment 3.

6. Current Status and Issues to be further Discussed on the Recommendations made by Joint Terminal Evaluation Mission

The following officers notified as the Focal Persons for the actions for the recommendation made by Joint TEM were invited to make a presentation on their action plans. After each presentation Q &A sessions were followed.

Dr. Abdul Manan Khokar, Focal Person for extension activities, made a presentation regarding the progress and the plan of extension activities to be carried out by the Department.

Dr. Noor-un-Nisa Mari, Focal Person for publicity, made a presentation regarding the plan of publicity of the Project outcomes/materials.

Dr. Aziz Ahmed Palijo (DPM), Focal Person for PC-1 extension, made a presentation regarding the plan of extension of the PC-1.

Dr. Abdul Latif Keero, Focal Person for breeding activities, made a presentation regarding the plan of breeding activities to be carried out by the Department.

Dr. Musharaf Malkani, Focal Person for financial support for calf beneficiary farmers, made a presentation regarding the progress and the plan of providing subsidies and bank loan facilities for farmers.

Dr. Muzafer Ali Vighio, Focal Person for R/D extension, made a presentation regarding the progress and the plan of extension of the R/D to June 2020.

After the presentations Mr. Okabe requested that they should include a proper timeline for all the above actions. He said that he himself would be available for discussing further with each focal person during the next week.

See Attachment 4 for the details of the presentations and the discussions for each action.

7. Closing Remarks

Syed Sohail Akbar Shah, Secretary Livestock and Fisheries, appreciated dedicated works of the Department officers for actions to be taken, offered his support when needed and wished for the success of the Project upon closing the meeting. Dr. Ghulum Sarwar Shaikh added that all Executive Directors and Directors are invited to join the meeting with the Secretary at 11:00 a.m. on 16 October to discuss further about the above actions including the plan of restructuring of the Department.

8. Vote of Thanks

Dr. Abdul Qadir Junejo, Executive Director, Poultry Production, concluded the meeting by appreciating all the peoples' presence in the meeting. He highlighted that all actions must be completed within a set timeline.

End.

Syed Sohail Akbar Shah
Secretary Livestock and Fisheries
Government of Sindh

Mr. Hiroshi Okabe
Team Leader
JICA Project Team

Dr. Ali Akbar Soomro
Director General Livestock
Department of Livestock and Fisheries /
Project Coordinator, PSLD

Attachment 1 Meeting Agenda

The Project on Sustainable Livestock Development for Rural Sindh

AGENDA

Ninth Project Steering Committee Meeting

Thursday 11th October, 2018
Indus Hotel, Hyderabad

Time	Activities	Resource person
13:00	Lunch	
13:30	Guests to be seated	Project staff
13:35	Recitation from Holy Quran	Project Counterpart, Dr. Muhammad Arif Khan
13:37	Introduction of the participants	Facilitated by General Coordinator of JICA Project Team Dr. Ghulam Sarwar Shaikh
13:45	Welcome Address	DG Livestock Sindh/Project Coordinator Dr. Ali Akbar Soomro
13:50	Explanation of the Meeting Purpose & Agenda	Team leader of JICA Project Team Mr. Hiroshi Okabe
13:55	Current Status and Issues to be further Discussed on the Recommendations made by Joint Terminal Evaluation Mission	Mr. Hiroshi Okabe
14:20	Presentations and Discussion in details on Each Action Plan for the Recommendations	Each action plan shall be presented by the responsible persons of the Department Facilitated by Dr. Ghulam Sarwar Shaikh
14:50	Tea break	
15:05	continue the Presentations and Discussion	Facilitated by Dr. Ghulam Sarwar Shaikh
15:45	Closing remarks	Secretary, Government of Sindh, Livestock & Fisheries Department Mr. Syed Sohail Akbar Shah
15:55	Vote of Thanks	Dr. Abdul Qadir Junejo Executive Director, Poultry Sindh Karachi
16:00	Close	

Attachment 2 List of Participants

Sr. #	Name of the Officer	Designation
01	Syed Sohail Akbar Shah	Secretary Government of Sindh, Livestock & Fisheries Dep.
03	Dr. Ali Akbar Soomro	DG Livestock Sindh/Project Coordinator PSLD Hyderabad
04	Dr. Abdul Qadir Junejo	Executive Director, Poultry Sindh Karachi
05	Dr. Jamil Ahmed Shaikh	Executive Director, Animal Breeding Sindh Hyderabad
06	Dr. Siraj Ahmed Issani	Executive Director, Animal Husbandry Sindh Hyderabad
07	Dr. Zakir Hussain Subahpoto	Director, Animal Breeding Sindh Hyderabad
08	Mr. Muhammad Ayub Bhagat	Director Livestock Planning & Monitoring Sindh Hyderabad
09	Dr. Kirshan	Director, CVDL, Tando Jam
10	Dr. Muzafer Ali Vighio	Focal Person for Extension of R/D
11	Dr. Syed Gulzar Ali Shah	Additional Director, LS/AH, Tando Allahyar
12	Dr. Abdul Latif Memon	Additional Director, LS/AH Hyderabad
13	Dr. Abdul Karim Memon	Additional Director, LS/AH Matiari
14	Dr. Muhammad Rahim Khaskeli	Deputy Director, LS/AH Tando Muhammad Khan
15	Dr. Kewal Ram	Deputy Director, LS/AH Badin
16	Dr. Zahid Memon	Deputy Director, LS/AH Matiari
17	Dr. Mazhar Ali Rind	Deputy Director, LS/AH Tando Allahyar
18	Dr. Ghulam Sarwar Dero	Deputy Director, LS/AH Hyderabad
19	Dr. Noor-un-Nisa Mari	Focal Person for Publicity (AH)
20	Dr. Liaquat Ali Abro	Focal Person for Publicity (AB)
21	Dr. Abdul Latif Keerio	Focal Person for Breeding activities
22	Dr. Abdul Mannan Khokhar	Focal Person for Extension activities
23	Dr. Musharaf Malkani	Focal Person Subsidies/bank loans etc. for calf salvation
24	Dr. Ghulam Muhammad Jiskani	Counterpart, Farm Management
25	Dr. Iqtadar Ali Memon	Counterpart Marketing
26	Dr. Ali Akhtar Shahani	Counterpart, Livestock Reproduction

27	Dr. Naeem Siddique Ansari	Counterpart, Livestock Asset
28	Dr. Muhammad Mubarak Jatoi	Counterpart, Livestock Genetic Improvement
29	Dr. Rukhsana Vighio	Counterpart, Training/Chairperson CBU
30	Dr. Safdar Ali Fazlani	Counterpart, Feeding Management
31	Dr. Muhammad Arif Khan	Counterpart, Fodder Development & Production
32	Dr. Zulifqar Ali Pathan	Counterpart, Animal Health
33	Dr. Aneesa Soomro	Gender Specialist
34	Dr. Aziz Ahmed Palijo	Deputy Project Manager, PSLD
35	Dr. Muhammad Ali Brohi	V.O. Calf Salvation Center
36	Mr. Hiroshi OKABE	Team Leader JICA Project Team
37	Dr. Ghulam Sarwar Shaikh	General Coordinator, JICA Project Team
38	Dr. Rasool Bux Soomro	Technical Coordinator
39	Ms. Mika KAWAMOTO	Extension Expert
40	Mr. Kodai Yugeta	Training Management Expert
41	Mr. Asim Shaikh	Administration Coordinator
42	Ms. Zahida Soomro	Technical Coordinator 2

Attachment 3 Revised PDM version 3

PROJECT DESIGN MATRIX (PDM) version 4 for approval

Project Title: The Project on Sustainable Livestock Development for Rural Sindh
Duration: Six years and four months (24 February 2014 to June 2020)
Project Districts: Five Districts in Sindh Province (Badin District, Hyderabad District, Matiari, District, Tando Allahyar Districts, Tando Muhammad Khan District
Target Group: Farmers who regularly raise less than six heads of livestock (* see Note 1 for the details).
Date Prepared: Version 0 December 12, 2012、Version 1 November 26, 2014、Version 2 April 8, 2016、Version 3 December 28, 2016、 Version 4 (to be approved)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal The appropriate technologies and the methods for utilizing livestock resources are adopted by the farmers in and outside the pilot districts.	1. Appropriate technologies are disseminated to more than 3,000 livestock farmers in the project districts and more than 800 livestock farmers in non-pilot districts 2. More than 50% of target farmers regularly use at least one of the nine "A" rank appropriate technologies shown in the attached Appropriate Technology Development Checklist as monitoring indicators. 3. Some more stakeholders (e.g. commercial farmers, NGOs, target groups) in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes.	1. Ex-post Survey by the Department 2. Ex-post Survey by the Department 3. Ex-post Survey by the Department	Necessary budget is allocated to the Livestock Department regularly.
Project Purpose The foundation for increasing incomes and assets of livestock farmers is built up in the pilot districts. (the foundation includes development of appropriate technologies, establishment of extension structure, strengthening concerned institution and capacity-building of concerned officers)	In the project districts: 1. More than 70% of the target group (excluding the pilot farmers) regularly use at least one of the nine "A" rank appropriate technologies shown in the attached Appropriate Technology Development Checklist as monitoring indicators within one year from training completion. Whereas, more than 50% of the target group continue to regularly use at least one of the same nine technologies even after more than one year from training completion. 2. All guidelines developed by the Project are officially acknowledged by the Livestock Department.	1. Monitoring Survey by the Project 2. Interview to the management-level officers of the Department, Meeting	The Livestock Department establishes an implementation structure and allocates budget and staff for disseminating appropriate technologies in non-pilot districts. The counterparts continue to be engaged in the improvement and dissemination of appropriate technologies and knowledge to the other Department

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Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
		minutes	officers.
	3. Some stakeholders (e.g. commercial farmers, NGOs, target groups) in Sindh use the technologies/methods of salvaging buffalo calves and dry buffaloes.	3. Study on successful cases on utilizing livestock resources, interview to the stakeholders adopted the technologies/methods	The Livestock Department promotes the technologies/methods of salvaging buffalo calves and dry buffaloes.
	4. The counterparts, extension workers and other staff including incumbent officers in the pilot districts have the capacity to support farmers according to the guidelines prepared by the Project (see Note 2 for the target numbers of each guideline)	4. Examination (see Note 3 for the details), interview	
	5. The Standard Operation Procedures (SOP) is implemented by the Department to apply the guideline of technology, the extension plan and materials prepared by the Project for the entire Department. (see Note 4 for the details)	5. Interview to the management-level officers of the Department	
Output 1. The appropriate technologies and management for livestock development are established through on-farm application at the pilot farms. (see Note 5 for the details)	1-1. Effectiveness of appropriate technologies is verified at 25 pilot farms with the following indicators: 1) Average milk yield of cattle/buffaloes increases by more than 25 % compared with the current average of farmers in general (4 liters/day) 2) Average daily gain of cattle/buffaloes increases by more than 10 % compared with the current average of farmers in general (250 g/day)	1-1. Monitoring survey on cattle and buffaloes of pilot farms by the Project	Pilot and surrounding farms are not affected by serious flood or drought
	1-2. The counterparts have the capacity to instruct extension workers and incumbent officers on the contents of the technology guidelines prepared by the Project. (see Note 2)	1-2. Examination (see Note 3 for the details), interview	

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
2. The methods for utilizing livestock resources are verified. (see Note 6 for the details)	2-1. The survival rate of calves in 3 months after birth at the Calf Salvation Center exceeds 90% with the technology for salvaging new born calves.	2-1. Monitoring Survey by the Project	
	2-2. The methods of calf salvation including rearing by farmers are proven to be economically viable.	2-2. Monitoring Survey by the Project	
	2-3. It is confirmed that dry buffaloes are salvaged with improved reproduction technologies.	2-3. Monitoring Survey by the Project	
	2-4. The counterparts have the capacity to promote effective use of livestock resources to the public and private entities according to the guidelines prepared by the Project. (see Note 2)	2-4. Examination (see Note 3 for the details), interview, Case of promotion activities by counterpart	
3. The verified appropriate technologies and the methods for utilizing livestock resources are disseminated in the pilot districts with gender consideration.	3-1. The counterparts, master trainers, and extension workers have a capacity to instruct farmers according to the extension plans and materials prepared by the Project. (see Note 2)	3-1. Examination (see Note 3 for the details), interview	
	3-2. Appropriate technologies are disseminated to about 3,000 (2,000 male and 1,000 female) farmers.	3-2. Monitoring Survey by the Project	
	3-3. Effective methods for farmer-to-farmer dissemination of technologies are demonstrated.	3-3. Case study	

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Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
4. The capacity of the Livestock Department for project planning, management, and coordination is strengthened.	4-1. The annual plan report of the Project is prepared by the initiative of the Department. 4-2. The results of monthly monitoring are reported by the responsible district offices. 4-3. The annual evaluation report of the Project is prepared by the initiative of the Department. 4-4. The Livestock Development Platform is regularly held by the initiative of the Department. 4-5. The Standard Operation Procedures (SOP) is issued by the Department. (see Note 2 and Note 4 for the details)	4-1. Interview to stakeholders 4-2. Monitoring Report 4-3. Interview to stakeholders 4-4. Interview to stakeholders 4-4. SOP	
Activities 0. Conduct baseline survey 1-1. Select the pilot farms 1-2. Prepare the technology development plan with the pilot farmers 1-3. Conduct and analyse the on-farm applications at pilot farms 1-4. Prioritize appropriate technologies to be disseminated. 1-5. Monitor and evaluate the application of the identified technologies at farms 1-6. Conduct researches and/or activities with the stakeholders 1-7. Prepare and revise the guideline of technology based on the results 1-8. Conduct training on appropriate technologies for incumbent officers and staff (district deputy directors, veterinary officers, para-vets) in the pilot districts	**Inputs** **Japanese Government** 1. Technical experts (1) Team leader/ Institutional development (2) Livestock technology development 1 (3) Livestock technology development 2 (4) Livestock feeding management (5) Animal health/ Animal reproduction (6) Livestock extension / Gender (7) Marketing (8) Coordination/Training management 2. Provision of equipment 3. Acceptance of trainees by the Country Specific Training and the Third Country Training	**Sindh Government** 1. Counterpart personnel and supporting staff 2. Project office with necessary facilities 3. Equipment and facilities (to be discussed) 4. Running expenses 5. Available data, information, documents and maps 6. Others (to be discussed)	Necessary inputs for smooth implementation of the Project, such as project fund, counterpart personnel and supporting staff, vehicles, incentives to the staff, etc., are made available timely by the Sindh government.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
2-1. Select and prepare the Calf Salvation Center 2-2. Examine methods of buffalo calf distribution, dry buffalo distribution, and livestock sharing for dry buffaloes 2-3. Prepare the application plan for utilizing livestock resources. 2-4. Conduct and analyse the applications 2-5. Apply the identified methods to the farmers 2-6. Monitor and evaluate the application of the identified methods 2-7. Prepare the guideline of utilizing livestock resources 3-1. Prepare the extension plan 3-2. Prepare the extension materials 3-3. Conduct trainings for the master trainers and extension workers including women 3-4. Conduct extension activities for farmers 3-5. Monitor and evaluate the extension activities 3-6. Review and revise the extension plan and materials 4-1. Prepare operation guideline for the Project including project management, information sharing, coordination, etc. (see Note 4 for the details) 4-2. Conduct training for project planning, management and monitoring. 4-3. Establish a livestock development platform for coordination and information sharing among stakeholders 4-4. Review and revise the guideline 4-5. Organize training for the establishment of implementation structure for disseminating appropriate technologies in non-pilot districts.			**Preconditions** PC-1 for the Project is approved by the Pakistan government. Necessary budget is allocated for project implementation. Security situation in the project area does not seriously get worse.

Note 1: The target group is those who rear 1 to 5 cattle/buffaloes regularly, and can be categorized into any of the following:

1. Small scale farmers: Farmers who own more than 2.5 up to 5 acres of land.
2. Marginal scale farmers: Farmers who own up to 2.5 acres of land.
3. Tenants: Farmers who do not own land, but rent land for agriculture.
4. Non-farmers: Persons who work as agricultural labor and who work for non-agriculture activities such as shop keeper, artisan, business, services, etc.

Note 2: The target numbers of the officers and staff who have acquired a capacity according to each guideline are as follows:

Name of guideline	Target officers and staff
Guideline for Appropriate Technology	Eight technical counterparts understand the contents of the Textbook for Appropriate Technology of Dairy Farming to provide instruction as expected.
Guideline for the Methods for Utilizing Livestock Resources	Eight technical counterparts understand the contents of the Guideline for the Methods for Utilizing Livestock Resources to provide instruction as expected.
Extension Guideline	Three extension counterparts, 5 Master Trainers, and 20 extension workers (10 male and 10 female) understand the contents of Extension Guideline to provide instruction as expected.
Operational Guideline for the Project	Sixty % of the participants to SOP trainings understand the contents of the relevant SOP and can prepare it by themselves.

Note 3: The level of acquirement will be measured by examination or other methods to be decided by the Project.

Note 4: One of the purposes to prepare the operation guideline for the Project is to facilitate the application of the guideline of technology, the extension plan and materials prepared by the Project for the entire Department. However, since the Standard Operation Procedures (SOP) needs to be issued by the Department to enforce the entire Department to apply them, its issuance is included in the indicators for the Output 4.

Note 5: The appropriate technologies and management for livestock development consist of the areas of (1) farm management, (2) marketing, (3) feeding management, (4) fodder, (5) reproduction, (6) animal health, and (7) genetic improvement, and refer to "A" rank technologies in the "Appropriate Technology Development Checklist" prepared by the Project.

Note 6: The methods for utilizing livestock resources include salvation of buffalo calves and dry buffaloes, and the salvation of dry buffaloes include livestock sharing.

Attachment "A" Rank Technologies in Appropriate Technology Development Checklist

	Field	Title	Content	Monitoring Indicators
1	Marketing	Production of quality milk	A farmer doesn't adulterate milk with water.	
2	Feeding Management	(for milking cow) Supply of sufficient water	A milking cow drinks sufficient water.	
3	Feeding Management	Clean water	A water tank is regularly (at least once a week) washed.	✓
4	Feeding Management	(for milking cow) Use of improved tie method	A milking cow is kept by less stressful way.	✓
5	Feeding Management	(for milking cow) Use of simple roof	Simple roof for milking cow has a structure which provides comfortable environment with cool air.	✓
6	Feeding Management	(for milking cow) Dry floor	Floor where milking cows are kept is dried.	✓
7	Feeding Management	(for calf) Proper management of calf at birth	Newly born calf is managed properly.	
8	Feeding Management	(for calf) Provision of colostrum to calf at birth	Colostrum is given to calf within 6 hours after birth.	✓
9	Feeding Management	(for calf) Prevention management against heat	A calf under age of 3 months is kept in shade and is showered or water-sprayed to lower its body surface temperature.	✓
10	Feeding Management	Cow management at parturition	A cow is delivered at comfortable space and immediately treated.	
11	Feeding Management	(for buffalo) Bathing/shower	A buffalo is bathed or showered during hot season.	
12	Feeding Management	(for milking cow) Hoof-cutting	A cow at least one year gets hoof-cutting.	
13	Feeding Management	(for milking cow) Body Condition Score "BCS"	A farmer judges milking cow's body condition by BCS.	✓
14	Feeding Management	(for calf) Nutrition diagnosis	A farmer diagnoses nutrition level of his/her calf.	
15	Fodder	Cleaning of feed trough	Leftover in feed trough is thrown away so that cattle can always eat new fodder.	✓
16	Fodder	(for calf) Hay making	A farmer provides enough and good quality of dry fodder to calf.	✓
17	Reproduction	Heat detection	For heat detection, a farmer observes cow's condition before bedtime, such as mucus, bellowing and milk production volume.	
18	Genetic Improvement	Identification of good bull	Ability of a breeding bull which is used for mating is confirmed	
19	Genetic Improvement	Identification of good cow	Ability of a cow is confirmed	

Attachment 4 Progress of Actions for Recommendations by TEM

No.	Recommendations by the Joint Terminal Evaluation Mission	Focal Person	Progress and Future Plan presented by the F/P at the 9th S/C
11	Until the restructuring, Directorate of Animal Husbandry shall be in charge of extension, and Directorate of Animal Breeding shall be in charge of breeding of the Project activities	Dr. Abdul Manan Khokar (extension) Dr. Abdul Latif Keero (breeding)	(Extension) Progress: 1 VO and 2 SAs in 5 pilot districts have been named as the District Extension Team Plan: The District Extension Team shall work exclusively for the extension activities for 2 days a week, and 3 days for their own duties. In-house training is required to enhance their capacity when needed. The Secretary's comments: Timeline should be indicated in the plan. Training should be continuous, not "when needed". Mr. Okabe's comments: Even if they are notified to work exclusively for extension, is it really possible since they are busy with their own duties? The Secretary's reply: Government workers would not refuse any duties once they are notified. What is important is these officers/officials should not be frequently transferred. (Breeding) Plan: (1) Hold a meeting with technical staff of AB and district offices to plan activities. (2) Nominate the field staff. (3) Provide training by the C/P. (4) Select farmers, provide breeding / reproduction services and prepare monitoring reports. It was agreed that the Focal Person shall discuss more for detailing the plan with the technical C/Ps.

14	Publicity	Dr. Noor-un-Nisa Mari	Plan: (1) Collect materials from Project Team. (2) Develop publicity materials. (3) Select target audience / group. (4) Use various methods for publicity (newspaper, radio, TV, SNS, group discussions, website, mobile, booklets, etc.) (5) Coordinate with farmers. (6) Coordinate with media such as radio stations and TV stations. (7) Organize seminars and meetings with farmers. e.g. village visit, farmers day, dissemination of materials, audio or video clip show, successful case study report, exposure visit of farmers, meeting with stakeholders, etc. (8) Use the Department website for regular updating and uploading publicity materials. The Secretary's comments: TV show is not appropriate since the farmers do not possess TV. The way of publicity should be planned as per the needs of farmers. Areas should be carefully selected with easiness of access considered. A special team for publicity in remote areas is needed. Mr. Okabe's comments: Many ways of publicity were indicated. Prioritization (target areas and actions) and Timeline should be set. Available budgets need to be taken into consideration.
9	Complete approval of one-year extension of the revised PC-I by March 2019 and the preparation of PC-IV proposal by December 2019	Dr. Aziz Ahmed Palijo	Plan: (1) Discussed with Project Team on the extension proposal, (2) Approval of the proposal by the AD, (3) submission of the proposal to the P&D Dept., and (4) submission of the proposal to and approval by the EAD. The Secretary's comments: You should have reached at least (2) as of today. You should hurry up the process.

15	Propose Sindh Government for provision of subsides, bank loan, and any support to lessen initial and rearing costs to run calf salvation as business	Dr. Musharaf Malkani	Progress: 6 names of possible financial institutions have been listed. Plan: (1) Hold a meeting with financial institutions to clarify required documents and procedures for loans. (2) Gather basic information for financial support to livestock farmers. (3) Develop coordination between calf-rearing farmers and financial institutions. (4) Disseminate information to farmers through corner meetings, brochures, etc. The Secretary's comments: You should have a proper business model. The Department should form a team to interview the financial institutions, and then the role of the Department needs to be clarified. Will it be a guarantor for farmers or what else? For example, "Akhuwat" is an interest-free MFI specialized for poor farmers. We can think of possible ways of collaboration with them.
16	Extension of R/D (Record of Discussion)	Dr. Muzafer Ali Vighio	Progress: (1) Collection of the current R/D and an official format necessary for R/D extension is completed. Plan: (2) Review of the current R/D to be completed by 15 Oct. (3) Discussion with Project Team by 20 Oct. (4) Review of the PDM by 23 Oct. (5) Development of PO by 31 Oct. (6) Financial implication by 6 Nov. (7) Share draft R/D with Project Team by 12 Nov. (8) Joint meeting of Project Team and GoS by 15 Nov. (9) Meeting with the Secretary in the 3rd week of Nov. (10) Meeting with the P&D in the last week of Nov. (11) Forwarding the R/D to EAD in the last week of Nov. Meeting with EAT and approval in the 1st week Dec. Mr. Okabe's comments: Since we don't stay here for long period, during our absence we will discuss through Skype.

Attachment 6-5-4 Minutes of the Fifth Livestock Development Platform Meeting

Minutes of Meeting

Title	5th Livestock Platform Meeting
Date / Time	5th December 2018, 10:30-
Place	Indus Hotel, Hyderabad
Participants	See Attachment 2
Agenda	To share achievements of PSLD activities with various stakeholders in the livestock sector in Sindh Province.
Attachment	1. Meeting Agenda 2. List of Participants

1. Recitation from Holy Quran

2. Introduction of the Participants

3. Welcome Address

Dr. Abdul Qadir Junejo, Director General, Livestock Department / Project Coordinator, welcomed the participants upon opening of the meeting.

4. Keynote Address

Dr. Shigemochi Hirashima, Senior Visiting Advisor, South Asia Department, JICA Headquarters, made his keynote address titled as "Livestock as an Asset for Sustainability for Poverty Reduction Strategy: A Case Study of Sindh". In his address he highlighted importance of livestock as an asset to ensure sustainability for reduction of poverty of small-scale farmers by presenting data from different sources and those obtained during the Master Plan Study.

5. Presentation on the Project Progress and Achievements till Date

Dr. Junejo shared the overview, targets and achievements of the PSLD till today. He explained the objective of the project is to improve livelihood of small-scale livestock farmers in Sindh Province by working on four areas of activities of 1) development of appropriate technologies, 2) utilization of livestock resources, 3) dissemination of appropriate technologies, and 4) capacity building of the Livestock Department officers.

6. Development of Appropriate Technologies – Output 1 Targets and Achievements

Dr. Muhammad Mubarak Jatoi, C/P Genetic Improvement, shared the targets, achievements till today and a future plan of Output 1 activities of the PSLD, which is development of appropriate technologies.

After his presentation, Mr. Mukhtair Sahto, CEO, Shadab Organization, suggested that the trainers developed through this project should be utilized for the whole Sindh and that the second phase of the project should start from Sanghar District. He explained that his organization works on Islamic microfinance and shares the same focus with the project that is to give technical guidance to farmers. Dr. Muhammad Arif Khan, C/P Fodder Development, replied that they are ready to train farmers and technicians if such a request from NGOs is received.

Dr. Muzafer Vighio, Director Extension, Livestock Department, said that he had found it difficultt for the

manufacturer of formula feed to supply an enough quantity of formula feed to farmers. Dr. Safdar Fazlani, C/P Feeding Management, answered that the Project has a plan to communicate with other manufacturers for producing and distributing more formula feed to farmers.

Dr. Meena Memon, Veterinary Officer, Livestock Department, asked a question about the percentage of the concentrates used in formula feed. Dr. Safdar answered that they used 12 different local ingredients with different ratios.

7. Utilization of Livestock Resources – Output 2 Targets and Achievements

Dr. Naeem Siddique Ansari, C/P Livestock Assets, shared the targets and achievements till today, and a future plan of Output 2 activities of the PSLD, which is utilization of livestock resources.

After his presentation, Dr. Sabir Ali Shah, Deputy Director Jamshoro, Livestock Department, questioned the number of calves raised in the Calf Salvation Center, the rearing cost per calf, and the mortality rate of the calves. Dr. Naeem answered that in total more than 120 calves had been raised in the Center; the rearing cost per calf is 38,000 rupees for 3 months distribution model due to the high costs of milk and staff; and the survival rate is more than 92%.

Dr. Nasrullah Panhwer, FAO, questioned the long-term feasibility of this calf salvation model. Dr. Naeem answered that the model is feasible in a 3.5 years cycle that starts from distribution of two calves to a farmer and ends at receiving one of the reared adult buffaloes from the farmer.

Mr. Haji Amir, Commercial Farmer, Hyderabad, commented that he appreciated the technical guidance from the PSLD Team on calf salvation and dry buffalo recycling and consequently increased the number of the calves. He hoped that that this collaboration would be continued.

Dr. Abdul Manan Khokar, Veterinary Officer, Livestock Department, asked a question about timing of provision of colostrum to a newly-born calf, which is usually 4 or 6 hours after birth according to academic literatures. Dr. Safdar answered that they give colostrum immediately after birth, that is, within 1 hour.

Dr. Vighio suggested the developed technologies should be made open to farmers by giving them a chance to visit the Calf Salvation Center. Dr. Naeem answered that they had already provided workshops on calf salvation model to farmers. Then Dr. Vighio questioned who would take over the activities and the achievements of the PSLD. Dr. Junejo replied that it is now the Department's responsibility to take over this activity.

Dr. Musharf Malkani, Veterinary Officer, Livestock Department, questioned the ingredients of formula feed. Dr. Arif answered that there are 2 types of formula feed used at the Center and that the details would be provided in the booklet of Appropriate Technology Development Textbook, which would be finalized very soon.

Dr. Ghulam Mustafa Mari, HANDS, raised the issue of unavailability of Master Feed products in Sujawal District, their operation area. Dr, Arif answered that the PSLD can help establishing a linkage between HANDS and Master Feed Company if HANDS wishes.

8. Dissemination of Technologies and Methods to Farmers - Output 3 Targets and Achievements

Dr. Anisa Soomro, Team Leader, Extension Team, shared the targets and achievements till today, a future

plan of Output 3 activities of the PSLD, which is dissemination of technologies to farmers.

9. Capacity Building of the Officers of the Livestock Department - Output 4 Targets and Achievements

Dr. Rukhsana Vighio, Chairperson, Capacity Building Unit, shared the targets and achievements till today and a future plan of Output 4 activities of the PSLD, which is capacity building of the Livestock Department officers.

10. Views of the Participants

Participants from other stakeholders in Sindh livestock sector exchanged their views on today's meeting and suggestions for future collaborations for continuation and sustainability of the PSLD activities.

Mr. Haji Haider Bux Chhalgari, General Secretary, New Cattle Colony Association appreciated the efforts of PSLD and the Livestock Department. He requested Dr. Nasarullah, FAO, for arrangement of FMD vaccine in cattle colonies in Hyderabad. He also highlighted the issue of preparation and supply of artificial milk in the milk market in Hyderabad and requested Dr. Junejo, Director General Livestock, and Mr. Aijaz Ahmed Mahesar, the Secretary Livestock to take necessary actions. Mr. Aijaz replied that this is their mandate. He also promised that he would inform the Director General Food Authority Sindh and the Commissioner Hyderabad for their actions.

Dr. Noor-un-Nissa Mari, Dairy Development Officer, Livestock Department, suggested utilization of RTI facilities for training under the PSLD project.

Mr. Nawal Waswani, Manager, Thar Foundation, suggested that; (1) The Project should focus on technical trainings and develop a dairy business management model; (2) There should be a public private partnership between the Government and the private sector. The role of the Department should be capacity building, technical guidance, supervision and monitoring, whereas social problems can be solved by its partners; (3) There should be quality control of medicine, vaccine, and animal feed. The availability of microcredit loan and insurance facilities shall be investigated for small, medium and large-scale livestock farmers.

Dr. Jatoi replied that they are aware about the above issues and the PSLD had explored the resources in rural areas with small and medium-scale farmers and large-scale breeders. He continued that the capacity of rural farmers now increased through a series of training and raising of the awareness on modern technologies by technical counterparts and the extension team. He concluded that it is now the responsibilities of all the stakeholders present here and the Department to replicate the verified technologies.

Dr. Anisa replied that they respect and train the farmers and technicians who are willing to learn. She continued that the extension team and technical counterparts maintain the quality of training through continuous guidance, monitoring, and evaluation of trainees and their technology adoption rate.

Mr. Ahmed Ali Almani, Breeder from Tando Muhammad Khan, commented that there is no available data on livestock and no available website of the Livestock Department. Mr. Aijaz replied that the data is available in different directorates, but the website of the Department is not functional. Dr. Jatoi replied that the PSLD had collected data regarding breeders so they can facilitate those who want to receive such data.

Mr. Mehboob-al-Haq, CEO, Sindh Board of Investment (SBI), commented that the SBI offers such a service that it pays, on behalf of commercial and rural farmers, a mark-up of a loan that they have borrowed from any

commercial banks for maximum three years.

Dr. Baz Muhammad Junejo, Ex-Secretary Livestock, commented that the area of operation of the PSLD is too small, thus it is recommended to expand its operation areas. Then he continued that there is a need of publicity of the project, thus more publicity materials and videos should be developed on different subjects. Finally, he concluded that the project in the next phase should focus also on meat and wool production area based on the results of the Master Plan Study of this project, which he himself had been involved.

11. Policy Remarks

Mr. Aijaz, as Secretary Livestock, left his policy remarks that he appreciated Dr. Hirashima's keynote address and the cooperation of the Government of Japan as well as the efforts of the counterpart staff. He said that the challenge is to sustain, replicate, and upscale developed technologies. Then he reminded everyone in the hall to take their responsibilities to make it happen.

13. Vote of Thanks

Dr. Junejo concluded the meeting by appreciating all the participants' presence in the meeting. He suggested that this type of seminar needs to be held frequently in order to discuss and solve problems for the betterment of the project activities.

End.

Attachment 1 Meeting Agenda

The Project on Sustainable Livestock Development for Rural Sindh

AGENDA

Fifth Annual Meeting of
Livestock Development Platform
Wednesday, December 05, 2018
Indus Hotel, Hyderabad

The major stakeholders of the livestock sector in Sindh are invited to this livestock development platform meeting.

The main purpose of this meeting is to facilitate the discussion among the stakeholders on the direction of the livestock sector development in Sindh and the roles and responsibilities which each of them is expected to carry.

For that purpose, after the presentation by the project team on the project achievements, we would like to ask the participants for the feedbacks particularly on the follow points:

1. Your views on how the project could contribute more on the livestock sector development in Sindh
2. What roles and responsibilities you have for the development of the livestock sector
3. How practically you or your organization and the Project can be coordinated

At the end of the meeting, we expect that the participants have a consensus on the next actions necessary for the establishment of the policy for the livestock sector development in Sindh.

The Project on Sustainable Livestock Development for Rural Sindh

PROGRAMME

Fifth Annual Meeting of
Livestock Development Platform
Wednesday, December 05, 2018
Indus Hotel, Hyderabad

Time	Activities	Resource person
9:30-10:00	Guest registration	Dr. M. A Brohi, Dr. Farzana Sarki
Facilitator	Dr. Ghulam Muhammad Jiskani, Counterpart	
10:00	Recitation from Holy Quran	Dr. Muhammad Arif Khan
10:05	Welcome address	Dr. Abdul Qadir Junejo, Project Coordinator
10:10	Keynote address	Dr. Shigemochi Hirashima, Visiting Senior Advisor, JICA
10:40	Presentation on the Project progress and achievements till date	Dr. Abdul Qadir Junejo Project Coordinator
11:00	**Tea break**	
11:20	Development of appropriate technologies-Output-1 Targets and achievements	Presentation by Dr. Muhammad Mubarak Jatoi, Counterpart
12:00	Utilization of Livestock resources-Output – 2, Achievements	Presentation by Dr. Naeem Siddique Ansari, Counterpart
12:20	Dissemination of technologies and methods to farmers-Output – 3, Targets and achievements	Presentation by Dr. Aneesa Soomro, Gender Specialist
12:40	Capacity building of the officers of the Livestock Department-Output – 4, achievements	Presentation by Dr. Rukhsana Vighio, Chairperson CBU
13:00	**Lunch & Prayer break**	
13:40	Views of the participants: University, NGOs, Private Sector, Donor Projects, Progressive Farmers, Livestock holders in Cattle colony/Farmer	Representation from each segment appreciated
14:10	Next actions - For the development of livestock sector in Sindh	Facilitator Dr. Ghulam Muhammad Jiskani, Counterpart
14:30	Policy remarks	Mr. Aijaz Ahmed Mahesar, Secretary Livestock & Fisheries Department Govt. of Sindh
14:50	Vote of thanks	Dr. Abdul Qadir Junejo. Project Coordinator
15:00	**Evening tea**	

Attachment 2 List of Participants

#	Name of Participants	Designation/Expertise
Livestock Department		
1	Mr. Aijaz Ahmed Mahesar	Secretary, Livestock and Fisheries Sindh
2	Dr. Abdul Qadir Junejo	Director General Livestock Sindh/ Project Coordinator
3	Dr. Jamil Ahmed Shaikh	Executive Director Animal Breeding Sindh
4	Dr. Ahtesham ul Haq	Director Animal Husbandry Sindh
5	Mr. Muhammad Ayub Bhagat	Director Livestock Planning and Monitoring Sindh
6	Dr. Sikandar Ali Panhwar	Director Poultry Production & Research Sindh
7	Dr. Abdul Rahim Dero	Director Veterinary Research and Diagnosis Sindh
8	Dr. Muzafer Ali Vighio	Director Livestock Extension Sindh
9	Dr. Zakir Hussain Subahpoto	Director Animal Breeding Hyderabad
10	Dr. Abdul Latif Memon	Addi: Director Animal Husbandry Hyderabad
11	Dr. Kirshan	Additional Director, Livestock Production Hyderabad
12	Dr. Ghulam Rasool Jatoi	Additional Director, Vaccine Production CVDL Tando Jam
13	Dr. Abdul Karim Memon	Addi: Director Animal Husbandry Matiari
14	Dr. Zahid Memon	Deputy Director Livestock/Animal Husbandry Matiari
15	Dr. Ghulum Sarwar Dero	Deputy Director Livestock/Animal Husbandry Hyderabad
16	Dr. Jai Kumar Sonaro	Deputy Director Livestock/Animal Husbandry, T M Khan
17	Dr. Kewal Ram Asudani	Deputy Director Livestock/Animal Husbandry Badin
18	Dr. Mazhar Ali Rind	Deputy Director Livestock/Animal Husbandry Tando Allahyar
19	Dr. Noor-un-Nisa Mari	Dairy Development Officer, DG Officer
20	Dr. Abdul Latif Keerio	Deputy Director Animal Breeding Hyderabad
21	Dr. Syed Sabir Ali Shah	Deputy Director Livestock/Animal Husbandry Jamshoro
22	Dr. Musharaf Ali Malkani	Veterinary Officer, Animal Husbandry Hyderabad
23	Dr. Abdul Manan Khokar	Veterinary Officer, Animal Husbandry Hyderabad
24	Dr. Syed Muhammad Zeeshan	ARO PRI Karachi
25	Dr. Zulfiqar Panhwer	Veterinary OfficerAnimal Breeding Hyd.
26	Dr. Meena Memon	Veterinary Officer, Secreteriat/Focal Person
JICA		
27	Dr. Shigemochi Hirashima	Senior Advisor, JICA Headquarters
28	Mr. Masanosuke Sakaki	Country Officer, JICA Headquarters
29	Ms. Kazuho Ujiie	Representative, JICA Pakistan Office
30	Mr. Amir A. Bukhari	Senior Program Officer, JICA Pakistan Office
Sindh Government		
31	Dr. Hafeez-u-Rehman Kalhoro	Assistant Chief Livestock & Fisheries, P&D Department
32	Mr. Moosa Kamlo	Director Agri: Extension Hyd.

#	Name of Participants	Designation/Expertise
Donor Projects / NGOs		
33	Mr. Mukhtair Sahto	Shadab Organization NGO Sanghar
34	Dr. Shahid Kaimkhani	ILRI Hydrabad
35	Pro. Dr. N.M. Ibrahim	ILRI
36	Mr. Mehboobul Haq	CEO Sindh Boar Of Investment Karachi
37	Mr. Ghulam Ali	HANDS NGO Karachi
38	Dr. Ghulam Mustafa Mari	Incharge Calf rearing center HANDS NGO Karachi
39	Mr. Jameel Bhambaro	Shadab Organization NGO Sanghar (Calf rearing)
40	Mr. Abdul Haque	State Bank of Pakistan, Hyderabad
41	Dr. Nasrullah Panhwer	National Field Officer, FMD Control Project FAO Karachi
42	Mr. Nawal Wawani	Thar Foundation Karachi
Private Sector		
43	Syed Ali Hyder Shah	Breeders Association
44	Syed Muhammad Mujtaba	Zonal Head, Zarai Tarqiati Bank
45	Mr. Nadeem Khanzada	Organic Dairy Farmer
46	Mr. Haji Amir Ghouri	Commercial Farmer Hyderabad
47	Haji Hyder Chalgari	General Secretory Dairy farmers Association Cattle colony
48	Mr. M. Shahazad	Diamond Dairy Farm Karachi
49	Mr. Anas Jamil	Sindh Dairy Farm
50	Mr. Majid Ali Arisar	Danar Dairy farm Tando Allahayar
51	Mr. Jameel Memon	Sindh Dairy Farm
52	Mr. Danish Ali	Breeder
53	Syed M. Ibrahim	Fast Agri:
54	Mr. Ahmed Ali Malkani	Breeder TMK
55	Dr. Jaimal Dharani	Livestock Specialist
56	Dr. Baz Mohammad Junajo	Ex-Secretory Livestock
Livestock Department (Counterparts)		
57	Dr. Aziz Ahmed Palejo	Deputy Project Manager
58	Dr. Ghulam Muhammad Jiskani	Farm Management Specialist
59	Dr. Safdar Ali Fazlani	Feeding Management Specialist
60	Dr. Muhammad Mubarak Jatoi	Livestock Genetics Specialist
61	Dr. Zulfiqar Ali Pathan	Animals Health Specialist
62	Dr. Muhammad Arif Khan	Fodder Specialist
63	Dr. Iqtadar Ali Memon	Marketing Specialist
64	Dr. Ali Akhtar Shahani	Animal Reproduction Specialist
65	Dr. Naeem Siddique Ansari	Animal Assets Specialist
66	Dr. Rukhsana Vighio	Training Specialist / CBU Chairperson
67	Dr. Anisa Soomro	Gender Specialist

#	Name of Participants	Designation/Expertise
68	Dr. Farzana Sarki	Social Mobilization Specialist
69	Dr. Muhammad Ibrahim Shaikh	CBU Permanent Member
70	Dr. Muhammad Ali Brohi	Veterinary Officer, Calf Salvation Center
JICA Team		
71	Mr. Hiroshi Okabe	Team Leader / Institutional Development Expert
72	Ms Fumiko Ikegaya	Deputy Team Leader/ Marketing Expert
73	Dr. Hideo Tominaga	Appropriate Technology Development (1) Expert
74	Dr. Takeshi Abe	Animal Reproduction Expert
75	Mr. Yoshio Chiba	Genetic Improvement Expert
76	Ms. Noriko Hara	Appropriate Technology Development (2) Expert
77	Ms. Mika Kawamoto	Extension / Gender Expert
78	Mr. Kodai Yugeta	Training Management Expert
79	Dr. Ghulam Sarwar Shaikh	General Coordinator
80	Dr. Rasool Bux Soomro	Technical Coordinator (1)
81	Mr. Asim Shaikh	Administration Coordinator
82	Ms. Zahida Soomro	Technical Coordinator (2)

Attachment 6-5-5 Minutes of the Tenth Steering Committee Meeting

Minutes of Meeting

Title	10th Steering Committee Meeting
Date / Time	23rd January 2019, 11:00-16:00
Place	Pearl Hall, Indus Hotel, Hyderabad
Participants	See Attachment 2
Agenda	To review achievements of the Project in the 5 years To discuss the remaining works to be done after today
Attachment	1. Meeting Agenda 2. List of Participants

1. Recitation from Holy Quran

2. Introduction of the Participants

3. Welcome Address

Dr. Abdul Qadir Junejo, Director General Livestock / Project Coordinator, welcomed the participants upon opening the meeting. First of all, he appreciated technical guidance given by JICA to the Livestock Department for the last 5 Project years. At the same time, he showed his fear about a gap that would happen after 31 January when JICA Team leaves here. He mentioned that extension of the PC-1 had been approved by the PDWP and then it would be sent to and approved by the CDWP. In this regard he expected that support from the JICA would be continued.

4. Explanation of the Meeting Purpose, Overall Project Status, and Remaining Works

Mr. Hiroshi Okabe, Team Leader, JICA Team, explained that the purpose of today's meeting is to (1) review achievements of the Project in the 5 years, and (2) discuss the remaining works to be done after today.

He then explained that the Project Purpose has 5 indicators to be measured and levels of achievement of those 5 indicators were: (1) the application rate of appropriate technologies by farmers is yet to be measured because one year is yet to be passed since farmer training has been completed, (2) all the guidelines developed by the Project will be presented today, (3) some stakeholders started calf salvation activities, (4) counterparts' capacity has been developed., and (5) SOPs will be handed over to the Department today, but we should see whether it will implement them.

He then explained about the remaining works to be completed in the Project monitoring phase, February 2019 to June 2020 (expected). During this phase, all the Project Purpose shall be achieved, and the Overall Goal indicators shall be pursued. He also reminded that the Joint Terminal Evaluation Mission recommended the Project and the Department some actions to be taken for the project sustainability. Progress of these actions were:

(1) The PSLD has developed several videos for publicity of Project products.
(2) The PDM revision is completed and approved.
(3) Recruitment of a P/M is yet to be approved by the Sindh Government.
(4) Project products will be handed over to the Department today.
(5) TOR of special revolving fund for calf salvation activity is developed but the account is yet to be opened.

(6) Extension of the R/D until June 2019 is yet to be signed by the P&D Department.

(7) The PC-1 for publicity will be developed by the responsible officers.

(8) 1-year extension of the PC-1 has been approved by the PDWP and will soon be sent to the CDWP.

(9) Restructuring of the Department is now under review by the Secretary Office.

(10) The Directorate of Animal Husbandry has started its own extension activities.

(11) Possibility of provision of financial support by the Government or private banks to farmers for calf rearing is being studied through the interviews to several potential organizations.

(12) The D/G is temporarily in charge of disbursement of the PC-1 budget.

At the end he proposed that another meeting would be arranged on 29 January, 10:00 a.m. to discuss project implementation structure from February 2019, in which the D/G, all Executive Directors, Directors, C/Ps and other key officers would be invited. This proposal was accepted by the participants.

5. Achievements (incl. products), Plan from Today, and Issues/Countermeasures for Sustainability – Output 1

Dr. Ghulum Muhammad Jiskani, C/P Farm Management, explained that the PSLD Technical Team has selected 25 activities (17 for Output 1 and 8 for Output 2) to be continued during the Project monitoring phase. Such activities of Output 1 include:

(1) Conduct VOs and SAs training on appropriate technologies.

(2) Guidance and monitoring of appropriate technologies to pilot farmers.

(3) Consulting desk for technical services of all fields.

(4) Assistance on dairy economic analysis for small and medium scale farmers.

(5) Technical guidance of farm management to small and medium scale dairy farmers.

(6) Dairy farm management calendar for record keeping with appropriate technologies slogans.

(7) Coordination between small and medium scale dairy farmers and milk processors, and technical guidance to farmers.

(8) Milk fat % analysis services.

(9) Hoof cutting workshop.

(10) Guidance on farm facilities made of MS pipe and concrete slab for floor installation at farms. (Milking shed, Retainer and Paddock)

(11) Technical guidance for analysis of nutritive value of feed and fodder.

(12) Training on diagnosis and treatment of reproductive disorder for veterinarians in public and private sectors.

(13) Technical guidance and monitoring for reproductive disorder trainees in the field

(14) Training on andrology for veterinarians in public and private sectors.

(15) Demonstration of a model for prevention of disease (deworming and vaccination).

(16) Technical guidance on mastitis and brucellosis.

(17) Technical guidance on genetic improvement of Kundhi buffalo to breeders.

He also highlighted the following issues that need to be solved in order to continue the selected activities: (1) Smooth payment of C/P's allowance, (2) effective use of the PC-1 budget, (3) provision of mobility to the C/P, and (4) continuous employment of a data key punch operator.

After his presentation Dr. Asad Ishtaque, Deputy Secretary Livestock and Fisheries, asked about the issue of the data key punch operator, He asked whether she was hired by the Department or the JICA and why other Department officers were not able to succeed her duties. Dr. Jiskani answered that

she had been hired by the JICA Team and received directly technical guidance from the JICA Team and that was why no other Department officers could replace her. Dr. Asad said that there was not much they can do for staff employment, but instead he suggested utilization of the Department IT staff. Dr. Muhammad Mubarak Jatoi, C/P Genetic Improvement, replied that she was the only person who could continue data analysis at office while other counterpart officers left for field activities. Dr. Junejo replied that he had already assigned Mr. Rehan Solongi to take over her duties and that if needed training for data management could be arranged by the ADP scheme Project "Capacity Building of the Department Officials" thereby the problem would be solved.

At the end Dr. Junejo mentioned that provision of allowance to counterpart staff would be lengthy process but now he was the person to oversee this issue and that he had completed the first phase of payment and now he was working on the second phase of the payment. He also mentioned that he had agreed on provide necessary vehicles for counterparts' field activities in the discussion held with Mr. Okabe and Dr. Sarwar a few days ago.

6. Achievements (incl. products), Plan from Today, and Issues/Countermeasures for Sustainability – Output 2

Dr. Naeem Siddique Ansari, C/P Livestock Assets, explained that the PSLD would work on the following activities in the monitoring phase. Such activities of Output 2 include:

(1) Demonstration of technique and methods for 3-month-old buffalo calf distribution.
(2) Demonstration of technique and methods for few-days age / one month age of buffalo calf distribution
(3) Technical guidance and monitoring of buffalo calves after distribution to farmers
(4) Technical guidance on calf salvation models to interested peoples or organizations
(5) Management of the amount recovered through sold heifers and calf.
(6) Use of Akhuwat finance for calf rearing farmers.
(7) Technical guidance on the appropriate calf sharing system.
(8) Improvement of conception rate of dry buffaloes.

After his presentation Dr. Muzafer Vighio, Director Extension, asked the reason why the Project had been providing training to other VOs and Department staff for calf salvation activities. He suggested that now that the counterpart officers were the experts, they should continue their current services. Dr. Jiskani answered that of course the counterpart officers would continue their current services, but they would like to increase the number of quality officers who would transfer knowledges to other people.

Dr. Shahani raised a question on the proposed sharing system between commercial farmers and rural farmers and asked how the Project could support this activity within the remaining Project period of almost 1 year. Dr. Naeem answered that the Project would establish only a linkage between them, and the actual technical guidance would be given by a commercial farmer, namely Mr. Haji Amir.

Dr. Junejo briefed about the new Livestock Minister's visit on the precious day. He explained that the Minister had visited the Calf Salvation Center and got interested. He asked many questions for steps to be taken to save calves in cattle colonies.

Dr. Zulfiqar Ali Pathan, C/P Animal Health, requested Dr. Naeem to highlight the issues of a special revolving fund. Dr. Junejo answered that the Department had submitted a letter to the Finance Department to ask for their approval on opening the account but received several objections from them. He said that the Department would continue to solve the issues.

Dr. Vighio asked about the current situation of the restructuring of the Department because a new

extension structure would be really in need by the Department. Dr. Asad answered that he was now working on it but faced several problems because creation of lots of higher BPS grade posts has been demanded by the parliament, which would require additional budget allocation. He promised, however, that he would work on it and solve the issues.

7. Achievements (incl. products), Plan from Today, and Issues/Countermeasures for Sustainability – Output 3

Dr. Aneesa Soomro, Team Leader, Extension Team, explained the levels of achievement of Output 3 indicators as: (1) through a series of Extension Team Training the Extension Team members enhanced their understanding of the Extension Materials and the Guideline, (2) through Farmer Training the Extension Team has achieved 59.4% of the target for male farmers and 97.5% of the target for female farmers, and (3) the Team has selected 19 core farmers and developed training materials.

Then she explained that from today the Extension Team would: (1) conduct field activity for pilot villages (monitoring of farmers' activity, core farmer training, and activity by the core farmers) and (2) conduct field activity for surrounding villages (farmer training, follow up after farmer training, monitoring of farmers' activity, core farmer selection, core farmer training and activity by the core farmers).

At the end she suggested that for sustainability of extension activity: (1) A P/M should be recruited immediately to assure timely disbursement of inputs and funds such as fuel and TA/DA. (2) The Department should regularize the service of the current data operator for maintenance of the extension activity database. (3) A vehicle and fuel for the Extension Team Leader should be allocated. (4) The PC-1 should be extended as soon as possible and the extension structure should be developed in the Department to continue training for female farmers since the current female extension workers were hired under the PC-1 and no female extension staff was available among the existing Department officers.

8. Achievements (incl. products), Plan from Today, and Issues/Countermeasures for Sustainability – Output 4

Dr. Rukhsana Vighio, Chairperson, Capacity Building Unit (CBU), explained the levels as achievement of Output 4 indicators were: (1) the PSLD had trained many Department officers but annual plan nor evaluation report is yet to be prepared by the Department, (2) the monthly (or fortnightly) monitoring practice is done by the Technical Team, the Extension Team and the CBU, (3) the 5th Platform Meeting was successfully organized by the initiative of the counterpart officers, and (4) 5 SOPs on Project activities had been developed.

In order to further achieve the above indicators, she suggested that from today: (1) The Project should continue provision of training on planning and evaluation for establishment of such a system. (2) Not only the Project Team but also the overall Department should have an effective monthly monitoring system. For that the Directorate of Planning and Monitoring should be strengthened. (3) The counterparts should continue to organize the Platform Meeting after next year and the D/G should be responsible for supervision. (4) the Director Animal Husbandry and the CBU Chairperson must assure utilization of the concerned SOPs.

Her last suggestions were that (1) instead of the PSLD, the CBU would continue provision of training after today, and that (2) for that purpose the CBU needed to be strengthened through allocation of the budgets, additional human resources and necessary facilities by a newly-prepared

PC-1.

9. Q&A Session

Dr. Asad appreciated that a new PC-1 for capacity building of the Department was currently being prepared by the CBU since the CBU is one of the most important components of the restructuring proposal. He then continued that in order to continue animal breeding activities 2 more good officers should be assigned. Dr. Junejo replied that he would ask Dr. Muhammad Mubarak Jatoi, C/P Genetic Improvement, and Dr. Ali Akhtar Shahani, C/P Animal Reproduction to submit him a proposal and then he would assure assignment of suitable officers to work with them.

Dr. Vighio asked how future training would be financed after today since the Project was going to be terminated very soon. Dr. Rukhsana answered that some of the training courses would be financed in the current PSLD PC-1, which would end in June 2019, and then the CBU was now developing a new PC-1, specially for the capacity building of the Department, in order to continue provision of training after June 2019.

Dr. Jatoi stated that the Project had developed a foundation of genetic improvement for the first time in the Sindh Province, which include a database in which 550 Kundhi buffaloes' data had been registered. He continued that assignment of 2 more appropriate officers from the Directorate of Animal Breeding would be good to work for genetic improvement activities in order to continue the activities in a realistic approach. He also highlighted importance of database management and analysis, and for that he strongly requested that the Department should employ a data key punch operator, who was a national staff lady who had accumulated her experiences through technical transfer by the JICA Team. He said that she could be hired on a temporary basis by the Department and in future the Kundhi Buffalo Association would be able to hire her to continue genetic improvement activities.

Ms. Kazuho Ujiie, Representative, JICA Islamabad Office, commented that JICA was concerned with publicity of the Project outcomes because provision of access to finance and information is important for the farmers. She hoped that the publicity videos developed by the Project would be utilized and a new separate PC-1 for publicity activities would be developed. She also hoped a consultation desk on appropriate technologies to be established in near future since this would be an interesting practice. She then suggested use of ICT for dissemination of technologies. She suggested that the Department use WhatsApp, in which the Department creates an advisory group and invites as many farmers as possible so that they can easily see and learn uploaded curriculums, materials, videos and such. She also suggested that the Department should collaborate with other NGOs or rural support programs to spread its activities into other districts. She offered financial and technical supports from the JICA in case the Department would require it.

In reply to Ms. Ujiie's suggestions, Dr. Asad answered that the Department had recently launched a new ICT project in which its IT Department is engaged. He agreed that the activities should be spread to other districts through provision of Project materials. He appreciated Ms. Ujiie's offer on provision of further assistance. In this regard he requested Dr. Junejo to develop a concept paper to be shared with the JICA Office. Dr. Ghulum Sarwar Shaikh, General Coordinator, JICA Team, added that a new PC-1 for publicity would include costs required to establish a publicity cell within the Department, based on information collected from the same unit of the Agriculture Department. He said that in future once the PC-1 process is completed, the Department might seek for the JICA's support to accommodate the required additional funds.

10. Handing Over of the Products and Equipment to the Department

Ms. Fumiko Ikegaya, Deputy Team Leader, JICA Team, explained a list of products developed by the Project and a list of JICA's equipment installed at the Project Office, at the PRI or elsewhere in the Department. She hoped that the Department would continue to utilize the products and the equipment and handed all of them over to Dr. Junejo, Director General Livestock.

11. Presentations and Discussion on Each Action Plan (recommended by the Terminal Evaluation Mission) and Progress

Dr. Ghulum Sarwar Shaikh, General Coordinator, explained that in the 8th Steering Committee held last year some of the action plans had been developed and several officers had been assigned to do those actions. Progress of some of the actions were presented by responsible officers as follows.

(1) Financial Support for Calf Rearing Farmers

Dr. Musharaf Malkani, V.O., Animal Husbandry Hyderabad, explained that he and his colleagues had made visits to 2 institutions; One is the Sindh Board of Investment (BoI) and the other is an Islamic microfinance institution, Akhuwat. He explained that they had found out that the BoI covers mark-ups of farmers' loans upon approval of the proposals, whereas Akhuwat offers zero-interest rate loans to farmers. He then explained that, when it comes to banks, the challenges are that most of them are targeting only large-scale farmers and they require high interest rate and collaterals.

After his presentation Dr. Kewal Ram, Deputy Director Badin, made a question on the detail procedures of the BoI subsidies. Dr. Sarwar answered that the procedures are: first, a farmer develops and submits a proposal to the BoI. Then the BoI's technical committee scrutinizes and approves the proposals. The proposal is sent to some of the nearby financial institutions which are on the BoI's list. Then the farmer borrow money from the institution and the BoI pays for the mark-ups. However, the problem is that they target only large-scale farmers. In reply to Dr. Sarwar's explanation Dr. Junejo commented that it is a duty of the Department to write a letter to the BoI requesting their considerations on application from conventional small-scale farmers.

Dr. Vighio suggested that farmers should know that such information is available at the Department. Dr. Sarwar answered that the responsible officers would develop a plan to disseminate information.

(2) CBU

Dr. Rukhsana explained that as per the action plan of the Capacity Building Strategy (CBS), which had been developed through the Project, the CBU had been working on (1) coordination of internal training, (2) coordination of external training, and (3) human resource database development in the last several years. She also mentioned that CBU would work for these 3 domains of activities as well as development of useful technical literatures / guidelines for Department officers after today. At the end she highlighted that the CBU should be strengthened as a permanent unit to continue provision of training through allocation of the budget, additional human resources and necessary facilities. And thereby they were now developing a new PC-1 for that purpose.

After her presentation Dr. Sarwar added that the role of the CBU is to implement the CBS. Then Mr. Okabe added that they had divided responsibilities of each of the CBS action plans among the CBU members. The Project had been and will be monitoring the progress of each action.

Dr. Junejo suggested that, in order to fill a financial gap between the development scheme and the non-development scheme, the CBU could consider utilization of some other financial systems such as the ADP scheme. Besides, he introduced the previous Secretary's suggestions that all the promoted

management-level officers should participate in training on management skills. He also mentioned that the Department's Research and Training Institute in Tando Muhammad Khan would be available and would welcome budget allocation under this new PC-1 because currently they had not been allocated enough budget to carry out their activities. Dr. Sarwar replied that, in his personal observation, things should not be mixed up but the new PC-1 should focus only on their mandates. Instead he suggested that the CBU should have a meeting with Dr. Junejo to finalize the things.

(3) Department Extension Team

Dr. Humayoon Samo, V.O. Animal Husbandry Hyderabad, explained that their Hyderabad, Tando Muhammad Khan and Badin teams had already started their first extension activities (village survey) and that Matiari and Tando Allahyar teams would start their activities soon after replacement of some of the assigned officers.

After his presentation Dr. Junejo asked what the mandate of Dr. Humayoon was. He pointed out that his mandate as the Focal Person of the Department Extension Team was to supervise the whole activities of extension team members.

Mr. Okabe mentioned that the Department Extension Team members were assigned to work only for 2 days per week exclusively for the extension activity and asked whether this was feasible for them to perform duties. Dr. Humayoon answered that it was fine so far but he would see what would happen after Matiari and Tando Allahyar team have started their activities.

Ms. Ujiie requested that the Team should have quantitative targets, such as the number of farmers to be trained, and measure the levels of achievement of their activities so that they could know what kind of budgets and assistance would be required in future. Ms. Mika Kawamoto, Extension Expert, JICA Team answered that the JICA Team had advised them not to set the targets for the time being since they should first focus on practicing and replicating the methods of the Project Extension Team as a trial stage.

12. Overall Project Performance and Sustainability Issues, Views of the JICA Office Islamabad

Ms. Ujiie left her remarks that she appreciated the Project had been successfully implemented for the last 5 years and reached this transition period, when all the initiatives could be transferred from the JICA Team to the Department. She hoped that the Project activities would be continued to achieve its long-term goal of increasing incomes and assets of livestock farmers, which is also a strategy of the JICA's assistance approach in Pakistan. Then she said that the JICA had the below 3 requests to the Livestock Department.

First, she requested that the Department should complete the official procedures of the PC-1 extension by February 2019, meaning getting approval from the CDWP, which is a critical point to extend the Project period from the JICA side. She also hoped that new PC-1s for publicity and the CBU would be sent to further approval process very soon so that the budget would be secured. She also requested immediate recruitment of a new Project Manager, which took more than 10 months since the ex-Project Manager left the position. She pointed out that without a P/M there would be no one to manage the Project since the JICA Team experts would be coming back here less often from February 2019.

Second, she requested that the Project activities should be disseminated to other districts in Sindh Province, which is a huge province and where many livestock farmers exist. For that, she suggested that the Department collaborate with other stakeholders such as NGOs and private sectors. She said

that she understood the new PC-1s would be ready by the time of the Project completion in June 2020, but she offered the JICA's assistance just in case the Department would be in need of their financial support.

Third, she mentioned about the possibilities of use of microfinance services for supporting rural livestock farmers. She said that the Project had worked on development of technologies and now it was the time for providing farmers with an access to finance. She said that the JICA was interested in financing some of financial institutions on loan basis to support them in their provision of loans to small scale farmers, who are the riskiest clients to them. She requested the Department to introduce some of the possible counterpart organizations to consider possibilities of such a project.

Finally, she concluded her remarks by appreciating the efforts of passionate counterpart officers and by expecting them to be even more passionate in their future activities.

13. Closing Remarks

Dr. Asad, on behalf of the Secretary Livestock and Fisheries, extended his gratitude for the last 5 years of technical assistance given by the JICA. He requested that the JICA would continue the same kind of activities in other districts. He also appreciated all the efforts made by the Department and the Counterparts so far. He looked forward to seeing that technologies developed through the Project be disseminated into the whole Sindh Province in future.

14. Vote of Thanks

Dr. Junejo appreciated today's productive discussions and assured that all the discussed actions to be taken over by the Department under his responsibility as the Director General Livestock. He requested that the JICA would extend its activities in other 10 districts in future. He also mentioned that microfinance would be a good support to achieve our targets in the vast area of the Sindh Province. He also assured continuous use of the project office for the JICA Team in the monitoring phase.

End.

Attachment 1 Meeting Agenda

The Project on Sustainable Livestock Development for Rural Sindh

AGENDA

Tenth Project Steering Committee Meeting

Thursday 23rd January 2019
Indus Hotel, Hyderabad

Time	Activities	Resource person
10:00	Guests to be seated	Project staff
10:05	Recitation from Holy Quran	Project Counterpart, Dr. Muhammad Arif Khan
10:07	Introduction of the participants	Facilitated by Project Counterpart
10:15	Welcome Address	DG Livestock Sindh/Project Coordinator, Dr. Abdul Qadir Junejo
10:20	Explanation of the Meeting Purpose, Overall Project Status, and Remaining Works	Team leader of JICA Project Team, Mr. Hiroshi Okabe
10:40	Achievements (incl. products), Plan from Today, and Issues/Countermeasures for Sustainability – Output 1	Project Counterpart
11:10	Achievements (incl. products), Plan from Today, and Issues/Countermeasures for Sustainability – Output 2	Project Counterpart
11:25	Q&A on Output 1 and 2	Facilitated by Project Counterpart
11:40	Tea Break	
12:00	Achievements (incl. products), Plan from Today, and Issues/Countermeasures for Sustainability – Output 3	Project Counterpart
12:15	Achievements (incl. products), Plan from Today, and Issues/Countermeasures for Sustainability – Output 4	Project Counterpart
12:30	Q&A on Output 3 and 4	Facilitated by Project Counterpart
12:45	Handing over of the Products and Equipment to the Department	Deputy Team Leader of JICA Project, Team, Ms. Fumiko Ikegaya
12:50	Lunch	
13:40	Presentations and Discussion on Each Action Plan (recommended by the Terminal Evaluation Mission) and Progress	Each action plan shall be presented by the responsible persons of the Department Facilitated by General Coordinator of JICA Project Team, Dr. Ghulam Sarwar Shaikh

Time	Activities	Resource person
14:25	Overall Project performance and Sustainability Issues, Views of the JICA Office Islamabad	Representative, JICA Pakistan Office, Ms. Kazuho Ujiie
14:35	Closing remarks	Secretary, Government of Sindh, Livestock & Fisheries Department Mr. Aijaz Ahmed Mahesar
14:45	Vote of Thanks	Dr. Abdul Qadir Junejo
14:50	Evening Tea	

Attachment 2 List of Participants

#	Name of the Officer	Designation
01	Dr. Asad Ishaque	Deputy Secretary Livestock & Fisheries
02	Ms. Kazuho Ujiie	Representative, JICA Islamabad Office
03	Dr. Abdul Qadir Junejo	Director General Livestock / Project Coordinator
04	Dr. Jamil Ahmed Shaikh	Executive Director, Animal Breeding Sindh Hyderabad
05	Mr. Muhammad Ayub Bhagat	Director Livestock Planning & Monitoring Sindh Hyderabad
06	Dr. Ahter Sham	Director Animal Husbandry
07	Dr. Muzafer Ali Vighio	Director Extension
08	Dr. Kewal Ram	Deputy Director, LS/AH Badin
09	Dr. Zahid Memon	Deputy Director, LS/AH Matiari
10	Dr. Mazhar Ali Rind	Deputy Director, LS/AH Tando Allahyar
11	Dr. Ghulam Sarwar Dero	Deputy Director, LS/AH Hyderabad
12	Dr. Abdul Latif Keerio	Deputy Director Animal Breeding
13	Dr. Noor-un-Nisa Mari	Dairy Development Officer
14	Dr. Musharaf Malkani	V.O. Animal Husbandry Hyderabad
15	Dr. Humayoon Samo	V.O. Animal Husbandry Hyderabad
16	Dr. Ghulam Muhammad Jiskani	Counterpart, Farm Management
17	Dr. Iqtadar Ali Memon	Counterpart Marketing
18	Dr. Ali Akhtar Shahani	Counterpart, Livestock Reproduction
19	Dr. Naeem Siddique Ansari	Counterpart, Livestock Asset
20	Dr. Muhammad Mubarak Jatoi	Counterpart, Livestock Genetic Improvement
21	Dr. Rukhsana Vighio	Counterpart, Training / Chairperson, CBU
22	Dr. Safdar Ali Fazlani	Counterpart, Feeding Management
23	Dr. Muhammad Arif Khan	Counterpart, Fodder Development & Production
24	Dr. Zulifqar Ali Pathan	Counterpart, Animal Health
25	Dr. Aneesa Soomro	Counterpart, Gender / Team Leader, Extension Team
26	Dr. Farzana Sarki	Counterpart, Social Mobilization
27	Dr. Aziz Ahmed Palijo	Deputy Project Manager, PSLD

#	Name of the Officer	Designation
28	Dr. Muhammad Ibrahim Shaikh	Permanent Member, CBU
29	Mr. Hiroshi Okabe	Team Leader JICA Team
30	Ms. Fumiko Ikegaya	Deputy Team Leader, JICA Team
31	Dr. Hideo Tominaga	Appropriate Technology Development (1)
32	Ms. Noriko Hara	Appropriate Technology Development (2)
33	Ms. Mika Kawamoto	Extension Expert
34	Mr. Kodai Yugeta	Training Management Expert
35	Dr. Ghulam Sarwar Shaikh	General Coordinator, JICA Project Team
36	Dr. Rasool Bux Soomro	Technical Coordinator
37	Mr. Asim Shaikh	Administration Coordinator
38	Ms. Zahida Soomro	Technical Coordinator 2

Attachment 6-5-6 Minutes of the Online Meeting for Project Completion

Minute of Meeting

Date and Time	10:00-13:00 PST, June 24, 2021
Participant	JICA Team: Okabe, Tominaga, Kawamoto, Yugeta, Sarwar, Asim Department: See the attached list
Agenda	Way forwards for the sustainability of the Project
Attachment	1. List of Participants from the Department

The meeting agreed on the following items.

<Restructuring of the Department>

- The D/G will organize the restructuring committee to refine the plan according to the Minster's suggestions/advice. Soon after the plan is revised, the D/G will meet with the Minister and the Secretary to gain a consensus and to submit the document to the Government.
- 500 newly recruited veterinarian should be utilized for the extension activities,

<Budgeting Issue>

- The PC-4, prepared last year, is yet to be submitted to the Department because the project period was extended and is yet to be completed. Immediately after June 30, the Department will submit the PC-4 to the Planning Department and the Finance Department.
- There is also a chance of getting the funds by submitting the Summary to the Chief Minister. The Department will take an action also on this.

<Implementation of the 3-year action plan with zero funding>

- The 3-year action plan is yet to be shared with the Department. Next week the D/G and the Directors will sit with the C/Ps to receive a presentation on the details of the action plan. After that the D/G will develop a strategy to implement with the Department's own resources.

<SOP>

- The 6 SOPs have been developed so far. The Secretary will notify all the Department officers of the utilization of those 6 SOPs for the project activities.

<Output 1 & 2>

- Dr. Tominaga mentioned that:
- C/Ps should demonstrate knowledge and skills gained through the project under any circumstance in future.
- Even if C/Ps do not have any budget, they should find out an appropriate way for taking actions.
- In October or November 2021, a JICA study mission on genetic improvement might visit Sindh. JICA will form and start a mini-project as soon as possible.
- A new project on technology development in the KP Province has already started. The C/Ps will have a chance to share their experience with KP Project members.

<Output 3>

- Ms. Kawamoto mentioned that:
- The Extension Directorate should be established to continue the extension activities.
- The Extension Team Leader will be able to continue for the Department since she passed the examination but is still waiting for the official appointment.
- Other Extension Team members' experiences will be lost unless proper job opportunities (regardless in the public or private sector) will be provided to them.
- Dr. Vighio answered that it would be possible to mobilize the master trainers for the capacity building of the Department officers.
- Dr. Asad answered that the master trainers can be hired by the BPSYDP if it will need more human resources for its activities.
- The D/G will take care of the proper keeping of physical and digital extension training materials as well as distribution of the remaining vaccination calendars to farmers.

<Output 4>

- Mr. Yugeta mentioned that:
- The project management training should be continued with zero budgets by mobilizing the master trainers on the three topics.
- The Capacity Building Strategy should be examined once again and some of the actions should be implemented.
- Dr. Rukhsana suggested to provide training to newly recruited officers.
- Dr. Asad and Dr. Vighio assured that the Department would take care of the CBU to make it a permanent unit to deal with capacity building of the Department officers.

Attachment: List of Participants from the Department

Sr. #	Name of the Officer	Designation
01	Dr. Asad Ishaque Kumbhar	Deputy Secretary Livestock
02	Dr. Muzafer Ali Vighio	Director General, Livestock Sindh Hyderabad
03	Dr. Ghulam Rasool Jatoi	Executive Director, Animal Husbandry Sindh Hyderabad
04	Dr. Nobat Khan Khoso	Director Veterinary Research & Diagnosis Sindh, CVDL Tando Jam
05	Dr. Muhammad Mubarak Jatoi	Director @ Directorate General Livestock (Ext. & Res.) Sindh Hyderabad
06	Dr. Habibullah Shaikh	Additional Director LS/AH Matiari
07	Dr. Arshad Hussain Khanzada	Additional Director LS/AH Hyderabad
08	Dr. Naeem Siddique Ansari	CP Livestock Asset PSLD Hyderabad
09	Dr. Iqtadar Ali Memon	CP Marketing PSLD Hyderabad
10	Dr. Ali Akhtar Shahani	CP Animal Reproduction PSLD Hyderabad
11	Dr. Ghulam Muhammad Jiskani	CP Farm Management PSLD Hyderabad
12	Dr. Rukhsana Vighio	Chairperson CBU Hyderabad
13	Dr. Zulfiqar Ali Pathan	CP Animal Health PSLD Hyderabad
14	Dr. Muhammad Arif Khan	CP Fodder Development PSLD Hyderabad
15	Dr. Safdar Ali Fazlani	CP Animal Feeding PSLD Hyderabad
16	Dr. Mazhar Ali Rind	Deputy Director LS/AH Tando Allahyar
17	Dr. Jamal-ul-din Junejo	Deputy Director LS/AH Badin
18	Dr. Jai Kumar	Deputy Director LS/AH Hyderabad
19	Syed Ausaf Abbas	Representative Deputy Director LS/AH Matiari
20	Dr. Muzaffar Ali Memon	Deputy Director LS/AH Tando Muhammad Khan
21	Dr. Muhammad Ibrahim Shaikh	Permanent Member CBU Hyderabad
22	Dr. Anisa Soomro	Gender Specialist, PSLD Hyderabad
23	Dr. Muhammad Jokhio	Project Manager, PSLD Hyderabad

Project on Sustainable Livestock Development for Rural Sindh
in the Islamic Republic of Pakistan

Project Completion Report

List of Appendix

Appendix 1

Output 0: List of the Technical Products for the Project (Baseline Survey Report)

Appendix T0-1 Survey on Target Farmers' Current Situation

Appendix T0-2 Survey on Cattle Colony Farmers' Current Situation

Output 0: List of the Other Products of the Project

Appendix Z0-1 Project Leaflet (Japanese)

Appendix Z0-2 Project Leaflet (English)

Appendix Z0-3 Project Leaflet (Sindhi)

Appendix Z0-4 COVID-19 Impact Survey Report (Institutional Side)

Appendix Z0-5 COVID-19 Impact Survey Report (Technical Side)

Output 1: List of the Technical Products for the Project (Appropriate Technology Guideline)

Appendix T1-1 Textbook for Appropriate Technology of Dairy Farming for Livestock Technician (May 2020 version) (English)

Appendix T1-2 Textbook for Appropriate Technology of Dairy Farming for Livestock Technician (April 2020 version) (Sindhi)

Appendix T1-3 Text for Financial Analysis for Farm Management

Appendix T1-4 Textbook for Marketing

Appendix T1-5 Textbook for Feeding Management and Fodder

Appendix T1-6 Textbook for Nutritional Evaluation of Feed Stuffs for Poultry and Ruminant

Appendix T1-7 Textbook for Diagnosis and Treatment of Reproductive Disorder of Dairy Cattle and Buffalo

Appendix T1-8 Handbook for Pedigree Registration of Kundhi Buffalo

Appendix T1-9 Textbook for Genetic Improvement of Kundhi Buffalo

Appendix T1-10 Poster (BCS)

Appendix T1-11 Poster (Weighing Scale)

Appendix T1-12 Poster (Body Weight Estimation Chart)

Appendix T1-13 Poster (Retainer)

Appendix T1-14 Feed Standard Table for Sindh Province

Appendix 2

Output 1: List of the Other Products of the Project

Appendix Z1-1 Manual for Hoof-Cutting Workshop

Appendix Z1-2 Delivery Estimate Scale

Appendix Z1-3 Manual of Milk Fat Analysis Gerber Method

Appendix Z1-4 Dairy Farm Record Calendar 2018

Output 2: List of the Technical Products for the Project (Farmers' Current Situation Survey)

Appendix T2-1 Survey on Sharing of Buffaloes in the Project Area

Output 2: List of the Technical Products for the Project (Textbook for Utilizing Livestock Resources)

Appendix T2-2 Textbook for Calf and Dry Buffalo Salvation

Appendix T2-3 Textbook for Calf Salvation (Sindhi Version)

Appendix T2-4 Manual for Distribution of Calves

Appendix T2-5 Guideline for Treatment of a Calf

Output 2: List of the Other Products of the Project

Appendix Z2-1 Results of Interviews at Microfinance Banks

Appendix Z2-2 Report on the Current Situation of Livestock Microfinance in Sindh

Appendix Z2-3 Proposal of the New Project for Buffalo Calf Salvation

Output 3: List of the Technical Products for the Project (Farmers' Current Situation Survey)

Appendix T3-1 Monitoring Report on Application of Appropriate Technology by Farmers (Part1)

Appendix T3-2 Monitoring Report on Application of Appropriate Technology by Farmers (Part2)

Appendix T3-3 Report on Selection of the Core Farmers

Output 3: List of the Technical Products for the Project (Extension Guideline)

Appendix T3-4 Extension Guideline

Output 3: List of the Technical Products for the Project (Extension Material)

Appendix T3-5 Textbook for Appropriate Technology of Dairy Farming for Extension Team (English Version)

Appendix T3-6 Textbook for Appropriate Technology of Dairy Farming for Extension Team (Sindhi Version)

Appendix T3-7 Teaching Guide for Extension Team

Appendix T3-8 Materials for Teaching the Farmers (English Version)

Appendix T3-9 Materials for Teaching the Farmers (Sindhi Version)

Appendix T3-10 Handbook for Extension Team

Appendix 3

Output 3: List of the Other Products of the Project

Output 4: List of the Technical Products for the Project (Baseline Survey Report)

Output 4: List of the Technical Products for the Project (Livestock Department Operation Guideline)

Appendix T4-8 Capacity Building Strategy

Output 4: List of the Other Products of the Project

Appendix Z4-1 Action Plan for 3 Years from July 2020


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