

**Livestock and Fisheries Department, Government of Sindh  
The Islamic Republic of Pakistan**

**The Project for the Master Plan Study on  
Livestock, Meat and Dairy Development  
in Sindh Province  
in the Islamic Republic of Pakistan**

**Final Report**

**Part 2  
Present Situations**

**October 2011**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

**KAIHATSU MANAGEMENT CONSULTING, INC.  
C.D.C. INTERNATIONAL CORPORATION**

RDD
JR
11-086

**Livestock and Fisheries Department, Government of Sindh  
The Islamic Republic of Pakistan**

**The Project for the Master Plan Study on  
Livestock, Meat and Dairy Development  
in Sindh Province  
in the Islamic Republic of Pakistan**

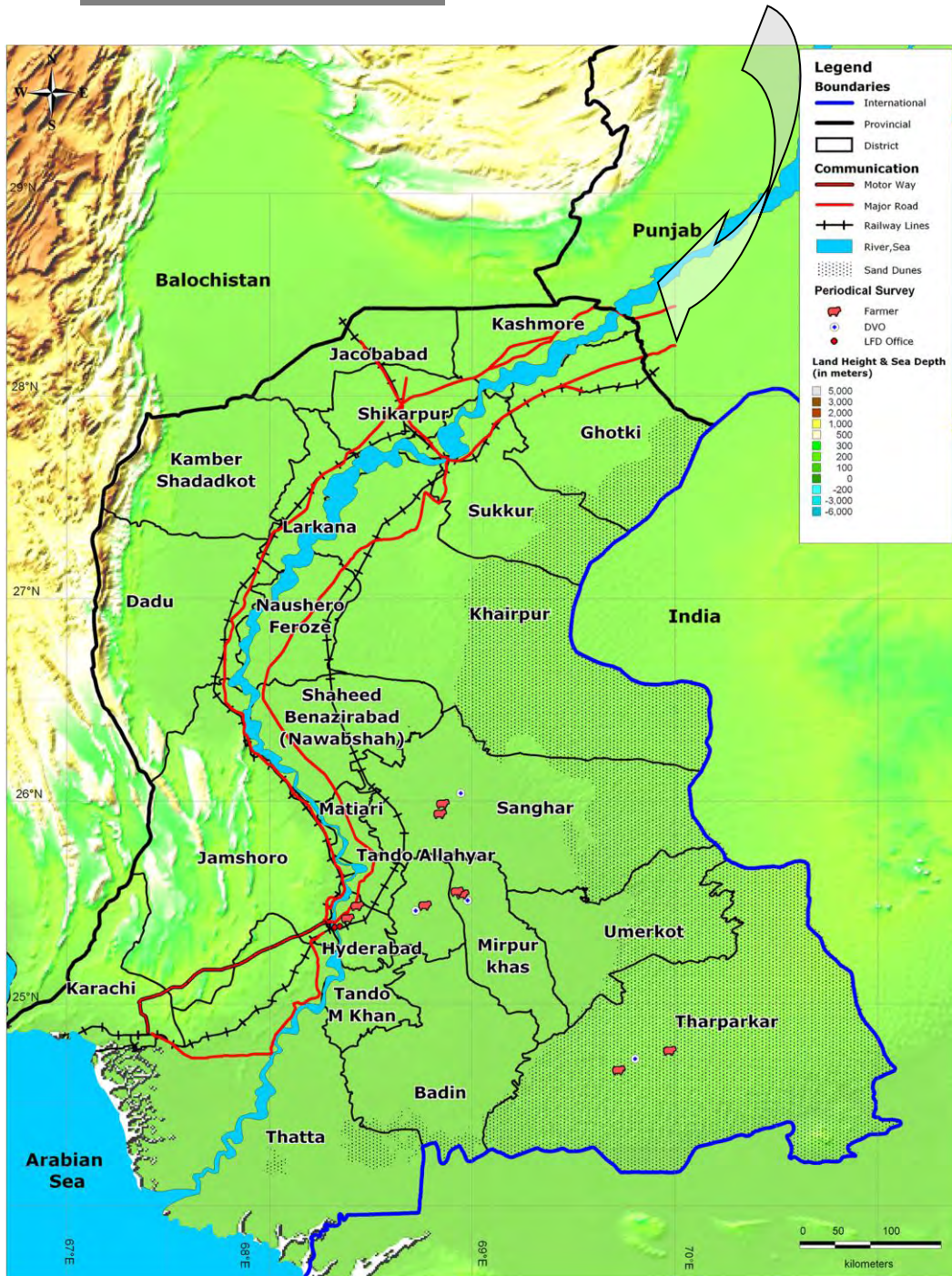
**Final Report**

**Part 2  
Present Situations**

**October 2011**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

**KAIHATSU MANAGEMENT CONSULTING, INC.  
C.D.C. INTERNATIONAL CORPORATION**



**Project Target Area**

**The Project for the Master Plan Study on Livestock, Meat and Dairy  
Development in Sindh Province  
in the Islamic Republic of Pakistan  
Final Report  
Table of Contents**

**PART 2 Present Situations**

Map

Tables and Figures

Abbreviations

**Chapter 5 Outline of the Field Survey**

5.1	Major Subjects and Methods of the Field Survey .....	5 - 1
5.2	Assignment of the Project Team.....	5 - 3

**Chapter 6 Major Socio-economic and Livestock Sector Profiles of Sindh**

6.1	Demography, Area, and Economy of the Province .....	6 - 1
6.2	Livestock Holdings and Productions.....	6 - 3
6.2.1	Livestock Holdings.....	6 - 3
6.2.2	Livestock Productions .....	6 - 6
6.3	Supply and Demand of Milk, Dairy Products, and Meat .....	6 - 7
6.3.1	Trends of Livestock Holding in Pakistan.....	6 - 7
6.3.2	Trends of Meat and Milk supplies in Pakistan.....	6 - 10
6.3.3	Summary of Historical Trends in Livestock Holding and Supply, and Examination on Future Trend .....	6 - 16
6.4	Food Security .....	6 - 19

**Chapter 7 Key Issues on Dairy and Meat Production and Productivity**

7.1	Overview .....	7 - 1
7.2	Natural Environment.....	7 - 1
7.2.1	Location and Climate .....	7 - 1
7.2.2	Agro-ecological Zone.....	7 - 2
7.3	Agriculture .....	7 - 4
7.3.1	Land Use and Main Crops.....	7 - 4
7.3.2	Water.....	7 - 6
7.4	Fodder and Feed Management.....	7 - 12
7.4.1	Issue of Feed Shortage.....	7 - 12
7.4.2	Overall Livestock Nutritional Demand and Possible Uptake of Nutrition from Feed Resources.....	7 - 14
7.4.3	Basic Forms of Feeding Management.....	7 - 16

7.4.4	Cases of the Mixed Farming.....	7 - 18
7.4.5	Animal Feeding in the Agro-ecological Zones.....	7 - 20
7.5	Livestock Promotion and Processing.....	7 - 31
7.5.1	Dairy Production and Farm Management.....	7 - 31
7.5.2	Meat Production and Farm Management.....	7 - 37
7.5.3	Genetic Improvement.....	7 - 43
7.5.4	Processing.....	7 - 48
7.6	Animal Health.....	7 - 50

## **Chapter 8 Value Chain**

8.1	Marketing.....	8 - 1
8.1.1	Milk.....	8 - 1
8.1.2	Dairy Products.....	8 - 10
8.1.3	Meat (Beef and Mutton).....	8 - 11
8.1.4	Poultry.....	8 - 16
8.1.5	Wool.....	8 - 17
8.1.6	Leather.....	8 - 18
8.1.7	Bone and other parts.....	8 - 18
8.1.8	Export Markets.....	8 - 18
8.2	Private Sector.....	8 - 26
8.2.1	Associations.....	8 - 26
8.2.2	Public Corporations.....	8 - 27
8.2.3	Private Companies.....	8 - 28

## **Chapter 9 Rural Society and Farm Households**

9.1	Socially-bounded Groups.....	9 - 1
9.2	Community Organizations.....	9 - 2
9.3	Decision Making.....	9 - 3
9.4	Landownership.....	9 - 5
9.5	Landowners and Landlords.....	9 - 5
9.6	Gender.....	9 - 7
9.6.1	Gender Status in Education and Health.....	9 - 7
9.6.2	Daily Activities and Women in Rural Areas.....	9 - 8
9.6.3	Recommendations for Livestock Development from Gender's Point of View.....	9 - 12
9.7	Rural Finance.....	9 - 14
9.7.1	Debt Holdings.....	9 - 14
9.7.2	Non-formal Lending.....	9 - 14
9.7.3	Microfinance.....	9 - 16
9.8	Household Economy.....	9 - 18
9.9	Livestock Sharing.....	9 - 35

9.10	Social Relationships among Stakeholders .....	9 - 41
9.10.1	Livestock Related Activities and Stakeholders in the Irrigated and Non-irrigated Areas .....	9 - 42
9.10.2	Relationships between Different Social Strata in the Irrigated and Non-irrigated Areas .....	9 - 45
9.10.3	Livestock Related Activities and Stakeholders in the Cattle Colony.....	9 - 47

**Chapter 10 Institutional Issues**

10.1	Livestock and Fisheries Department .....	10 - 1
10.1.1	Provincial Offices .....	10 - 1
10.1.2	District Offices .....	10 - 10
10.1.3	Livestock Development and Research Farm for Kundhi Buffalo.....	10 - 14
10.1.4	Main Strengths and Weaknesses of the Department .....	10 - 16
10.2	Extension and Education .....	10 - 18
10.2.1	Extension Resources Useful for Extension Services .....	10 - 18
10.2.2	Limiting Factors or Weaknesses .....	10 - 23
10.2.3	Countermeasures .....	10 - 24

<b>Chapter 11</b>	<b>Summary of the Major Issues for Livestock Development .....</b>	<b>11 - 1</b>
-------------------	--	---------------

## Tables

Table 6-1-1	Area and Population (projected in 2010) of Each District
Table 6-1-2	Sindh Economy (1999-2000)
Table 6-1-3	Ratio of Employed Population
Table 6-1-4	Poverty Rates in Each Province
Table 6-2-1	Number of Livestock Holdings in Each Province
Table 6-2-2	Number of Livestock Holdings in Each District of Sindh
Table 6-2-3	Number of Livestock Holdings per Person in Each District of Sindh
Table 6-2-4	Number of Cattle and Buffalo by Breed
Table 6-2-5	Distribution of Heard Size by Household and Livestock
Table 6-2-6	Number of Livestock in Sindh between 1976 and 2006
Table 6-3-1	Number of Livestock Animals in the Census Years in Pakistan
Table 6-3-2	Average Annual Growth Rates for the Number of Animals Between the Census Years
Table 6-3-3	Domestic Production of Meat by Type in Pakistan (Ratio to Total Quantity of Meat Supplied)
Table 6-3-4	Per Capita Consumption of Meat and Milk by Income Level (2007)
Table 6-3-5	Quantity of Production and Supply of Milk and Milk Products (excluding butter) in Pakistan
Table 6-3-6	Percentage of Households Who Own Cattle and Buffalo and Average Number of Holding
Table 6-3-7	Projected Population and GDP per capita in Pakistan
Table 6-3-8	Population in Cities in Pakistan
Table 6-4-1	Food Availability
Table 6-4-2	Food Security Status
Table 7-2-1	Mean Annual Rainfall for the Period of 1961-2009
Table 7-2-2	Districts and Talukas in Each Agro-ecological Zone
Table 7-3-1	Land Utilization
Table 7-3-2	Main Crops Grown in the Agro-ecological Zones
Table 7-3-3	Sources of Irrigation and Coverage
Table 7-3-4	Canals in Sindh
Table 7-3-5	Supply and Demand of Water for Cultivation
Table 7-3-6	Surface Salinity Status in the Period 2001-2004
Table 7-3-7	Profile Salinity/Sodicity Data for the Period 2001-2004
Table 7-3-8	Surface Salinity in Canal Command Areas
Table 7-3-9	Groundwater Depth
Table 7-3-10	Water Quality Guide for Livestock and Poultry Uses
Table 7-4-1	Feed Resource and Contribution Rate in Pakistan
Table 7-4-2	Estimated Annual Nutrients Requirements of Livestock in Sindh
Table 7-4-3	Estimated Annual Availability of Nutrients from Fodder and Crop Residues in Sindh

Table 7-4-4	Estimated Annual Availability of Nutrients from Fodder and Crop Residues in Sindh
Table 7-4-5	Balance between Annual Nutrients Requirements and Nutrients Availability from Crops in Irrigated Area of Sindh
Table 7-4-6	Feed Resources and Contribution Rate in Sindh
Table 7-4-7	Availability of Major Crop Residues in Irrigated Area of Sindh (2008/09)
Table 7-4-8	Availability of Pulse Residues in Irrigated Area of Sindh (2008/09)
Table 7-4-9	Value of Supplemental Feed for Milking Buffalo
Table 7-4-10	Value of Supplemental Feed for Milking Buffalo
Table 7-4-11	Value of House Compounded Feed for Milking Buffalo
Table 7-4-12	Production and Potential Availability of Residues (fibrous by-products) of Major Crops in Sindh 2008/09
Table 7-4-13	Potential Availability of Concentrates in Sindh 2008/09
Table 7-4-14	Salt Tolerance of Selected Plants for Forage
Table 7-4-15	Availability of Crop Residue in Non-irrigated Area of Sindh (2008/09)
Table 7-5-1	Daily per Head Milk Production
Table 7-5-2	Milk Production of Milk Selling HH and Self-consuming HH
Table 7-5-3	Difference in Milk Production of Buffalo and Cattle
Table 7-5-4	Ratio of Adult Female Buffaloes to Total Number of Cattle and Adult Female Buffaloes
Table 7-5-5	Persons in Charge of Livestock Management
Table 7-5-6	Persons in Charge of Milking Cows and Buffaloes
Table 7-5-7	Slaughter of Calves and Young Buffaloes
Table 7-5-8	Number of Households that Keep Sheep and Milk Them
Table 7-5-9	Number of Households that Keep Goats and Milk Them
Table 7-5-10	Milk Production per Head a Day for Sheep and Goats
Table 7-5-11	Number of Households that Produce and Sell Dairy Products
Table 7-6-1	Number of the Treated and Reported Cases in 2009/2010
Table 7-6-2	Numbers of the Animals Vaccinated in 2009/2010
Table 7-6-3	Results of Surveillance on Brucella
Table 7-6-4	Results of Surveillance on Bovine Tuberculosis
Table 7-6-5	Percentage of Farms Conducting FMD Vaccination, and its Service Providers
Table 8-1-1	Lactating Animals and Milk Production at Colonies
Table 8-1-2	Ratio of Milk Selling Households and Selling Volume
Table 8-1-3	Buyers of Milk
Table 8-1-4	Number of Milk Chiller Tanks of the Companies in Sindh
Table 8-1-5	Retail Price of Unboiled Fresh Milk in Karachi
Table 8-1-6	Milk Retail Price in Sindh Province (Dec 2010 to Jan 2011)
Table 8-1-7	Average Selling Price of Milk by District and Place to Sell
Table 8-1-8	Major Brands and Companies of Dairy Products in Pakistan
Table 8-1-9	Households that Sell Live Goats



Table 8-1-10	Households that Sell Live Sheep
Table 8-1-11	Number of Livestock Markets and Total Number of Livestock sold per week
Table 8-1-12	Sales Trend for the Last Few Years
Table 8-1-13	Sales Trend for the Last Few Years
Table 8-1-14	Retail Prices of Beef in Sindh in Dec. 2010 and Jan. 2011
Table 8-1-15	Retail Prices of Mutton in Sindh in Dec. 2010 to Jan. 2011
Table 8-1-16	Prices of Beef and Mutton in Karachi (December 2010)
Table 8-1-17	Market Price of Poultry in Sindh in Dec. 2010 to Jan. 2011
Table 8-1-18	Market Price of Eggs in Dec. 2010 to Jan. 2011
Table 8-1-19	List of Companies Dealing with Bones and Other Parts of Livestock
Table 8-1-20	Major Milk Export/Import Countries of Pakistan in 2008
Table 8-1-21	Major Beef Export/Import Countries of Pakistan in 2008
Table 8-1-22	Major Buffalo and Cattle Export/Import Countries of Pakistan in 2008
Table 8-1-23	Major Export/Import Countries of Beef in South and Western Asia in 2008
Table 8-1-24	Major Export/Import Countries of Buffalo/Cattle in South and Western Asia in 2008
Table 8-1-25	Major Export/Import Countries of Mutton in 2008
Table 8-1-26	Major Export/Import Countries of Sheep and Goat in 2008
Table 8-1-27	Major Export/Import Countries of Mutton in South and Western Asia in 2008
Table 8-1-28	Major Export/Import Countries of Goat/Sheep in South and Western Asia in 2008
Table 8-1-29	Major Camel Export/Import Countries of Pakistan in 2008
Table 8-1-30	Major Export/Import Countries of Camel meat in South and Western Asia in 2008
Table 8-1-31	Major Export/Import Countries of Camel in South and Western Asia in 2008
Table 8-2-1	Major Associations in Karachi related to Milk Distribution
Table 8-2-2	Major Associations in Pakistan related to Livestock Products
Table 8-2-3	Major Public Organizations and their Outlines
Table 8-2-4	Major Milk Processing Companies Collecting Milk and/or having Processing Plants in Sindh
Table 8-2-5	List of other major milk processing companies which mainly focus on Punjab
Table 8-2-6	Major Meat Exporting Companies in Karachi
Table 8-2-7	Number of Chiller Tanks installed and Number of Villages Receiving Agri-services by Major Milk Processing Companies
Table 9-1-1	Answers to "Does your household conduct collective work with other households?"
Table 9-1-2	What are the reasons for doing/not doing such collective work?
Table 9-2-1	Households that Belong to Any Community Organization or Community Group
Table 9-2-2	Conditions for being a Functional CO
Table 9-3-1	Decision Making in Villages
Table 9-3-2	Ways for Decision Making in Allahdino Soomro Village, District of Badin
Table 9-4-1	Tenure Classification of Farms and Farm Area
Table 9-5-1	Difference in Perception of Social Status between Landholders and Others
Table 9-6-1	District-wise Educational Statistics (2009-2010)

Table 9-6-2	Health Indicators for Maternal and Child Health Targets (2009-2010)
Table 9-6-3	Division of Work for Animal Husbandry
Table 9-6-4	Decision Makers on Livestock Management
Table 9-6-5	Rural Women's Participation in Pre-harvest Agricultural Activities
Table 9-6-6	Rural Women's Participation in Post-harvest Agricultural Activities
Table 9-6-7	Number of Respondents for "what are the constraints of being female?"
Table 9-7-1	Debt Holding HH
Table 9-7-2	Ratio of Households Who Borrow Money for Livestock
Table 9-7-3	Organizations or People from Whom Farmers Borrow Money
Table 9-7-4	Answers to "From Which Organization You Borrow Money?" (For Those Who Borrow Money for Livestock)
Table 9-8-1	Household Classification by Census of Agriculture
Table 9-8-2	Annual Cash Income, Consumption Expenditure, and Saving
Table 9-8-3	Annual Total Income, Consumption Expenditure, and Saving
Table 9-8-4	Average Livestock Holdings (Result from the First Household Survey)
Table 9-8-5	Average Livestock Holdings (Result from the Second Household Survey)
Table 9-8-6	Percentage Distribution of Each Component to Total Consumption Expenditure
Table 9-8-7	Sources of Income by Household Group
Table 9-8-8	Sources of Income (Percentage Distribution against Total Income)
Table 9-8-9	Value of Assets and Liabilities of Households by Different Type
Table 9-8-10	Percentage Distribution of Values in the Net Worth of Households
Table 9-8-11	Landholding Status of Household Head's Father
Table 9-8-12	Landholding Status of Household Head's Father (percentage)
Table 9-8-13	Distribution of Households in Total Milk Production and Propensity to Sell
Table 9-8-14	Number of Family Member for Each Category of Milk Production and Propensity to Sell
Table 9-8-15	Household Cash Flow in Livestock Sector
Table 9-9-1	List of Different Types of Sharing Agreement
Table 9-9-2	Average Number of Livestock Owned and Reared by Sharing Status
Table 9-9-3	Distribution of Households by Sharing Status (M.S.S)
Table 9-9-4	Distribution of Households by Sharing Status (Pabuhar)
Table 9-9-5	Annual Non- Livestock Income
Table 9-9-6	Average Number of Livestock Owned and Reared by Landholding Status
Table 9-9-7	Total Income and Livestock Income by Sharing Status
Table 9-10-1	Number and Percentage of Households selling Milk in M.S.S village
Table 9-10-2	Number and Percentage of Households selling Milk in Pabuhar village
Table 9-10-3	Number and Percentage of Households selling Live Animals in M.S.S village
Table 9-10-4	Number and Percentage of Households selling Live Animals in Pabuhar village
Table 9-10-5	Ratio of Sharing Livestock Households in Pabuhar Village by Biradari group
Table 10-1-1	Institutions under the Department

Table 10-1-2	Staff Allocation for the Directorate of the Director General’s Office
Table 10-1-3	Budgets Disbursed for the Director General’s Office
Table 10-1-4	Staff Allocation for the Directorate of Animal Husbandry
Table 10-1-5	Objectives of the Department and Institutions under the Directorate of Animal Husbandry
Table 10-1-6	Administrative Levels and Staff Allocations
Table 10-1-7	Annual Targets and Achievements of Non-development Activities
Table 10-1-8	Budgets Disbursed for Non-development Activities
Table 10-1-9	Number of the Development Schemes in the Last 3 Years
Table 10-1-10	Budgets Disbursed for Development Schemes
Table 10-1-11	Staff Allocation for the Directorate of Animal Breeding
Table 10-1-12	Artificial Insemination Provided in the last 3 Years
Table 10-1-13	Budgets Disbursed for Non-development Activities
Table 10-1-14	Budgets Disbursed for Development Scheme
Table 10-1-15	Staff Allocation for the CVDL including Sub-centers
Table 10-1-16	Main Activities of the CVDL in 2009/2010
Table 10-1-17	Budgets Disbursed for Non-development Activities
Table 10-1-18	Budgets Disbursed for Development Scheme
Table 10-1-19	Staff Allocation for the Directorate of Poultry Production and Research
Table 10-1-20	Main Achievements of the Non-development Activities
Table 10-1-21	Budgets Disbursed to the PRI for Non-development Activities (excluding the PVPC)
Table 10-1-22	Budgets Disbursed for Development Scheme
Table 10-1-23	Staff Allocation for the Directorate of Planning and Monitoring
Table 10-1-24	Budgets Disbursed for Non-development Activities
Table 10-1-25	Number of Staff under the DO Livestock/Animal Husbandry
Table 10-1-26	Major Job Description of the DO Livestock/Animal Husbandry Hyderabad
Table 10-1-27	Regular Budget for the DO Livestock/Animal Husbandry Hyderabad
Table 10-1-28	Annual Vaccination and Drenching Target
Table 10-1-29	Major Job Description of the DO Livestock/Animal Husbandry Karachi
Table 10-1-30	Number of Staff under the DO Livestock/Animal Husbandry
Table 10-1-31	Regular Budget for the DO Livestock/Animal Husbandry Karachi
Table 10-2-1	Trainings for Farmers by the Livestock related Programs/Projects in Sindh after 2006
Table 11-1	Potentials and Limiting Factors for Livestock Development by Subject

## Figures

Figure 5-1-1	Subjects Covered by the Field Survey
Figure 5-2-1	Assignment of the Project Team for the Field Survey
Figure 6-2-1	Number of Livestock in Sindh between 1976 and 2006
Figure 6-2-2	Milk Production in Sindh and Punjab between 1960 and 2000
Figure 6-2-3	Per Capita Consumption of Milk and Butter in Sindh between 1960 and 2000
Figure 6-3-1	Number of Livestock Holdings in Pakistan
Figure 6-3-2	Number of Chicken Holdings in Pakistan
Figure 6-3-3	Number of Draft Animal Holdings in Pakistan
Figure 6-3-4	Number of Livestock Per Capita
Figure 6-3-5	Number of Livestock Per Capita (2)
Figure 6-3-6	Number of Chickens and Ducks Per Capita
Figure 6-3-7	Comparison of Per Capita Number of Livestock: Cattle & Buffalo
Figure 6-3-8	Comparison of Per Capita Number of Livestock: Sheep & Goat
Figure 6-3-9	Quantity of Meat Supplied in Pakistan by Type
Figure 6-3-10	Total Meat Supplied and Population in Pakistan
Figure 6-3-11	Total Meat Supplied per capita and Income Per Capita in Pakistan
Figure 6-3-12	Supply of Beef and Population in Pakistan
Figure 6-3-13	Supply of Beef and Income Per Capita in Pakistan
Figure 6-3-14	Price of Beef and Per Capita Consumption in Pakistan
Figure 6-3-15	Supply of Mutton and Population in Pakistan
Figure 6-3-16	Supply of Mutton and Income Per Capita in Pakistan
Figure 6-3-17	Price of Mutton and Per Capita Consumption in Pakistan
Figure 6-3-18	Supply of Poultry and Population in Pakistan
Figure 6-3-19	Supply of Poultry and Income Per Capita in Pakistan
Figure 6-3-20	Price of Chicken and Per Capita Consumption in Pakistan
Figure 6-3-21	Consumption of Milk and Population in Pakistan
Figure 6-3-22	Per Capita Consumption and Income in Pakistan
Figure 6-3-23	Price of Milk and Per Capita Consumption in Pakistan
Figure 6-3-24	Projected Amount of Total TDN Required
Figure 6-3-25	Projected Amount of Total DCP Required
Figure 6-3-26	Projected Ratios of Available Nutrients
Figure 6-3-27	Projected Ratios of Available Nutrients with the 1 % Annual Increase of Resource
Figure 7-2-1	Mean Rainfall for the Period of 1961-2009 (mm)
Figure 7-2-2	Mean Maximum Temperature for the Period of 1961-2009 (°C)
Figure 7-2-3	Mean Minimum Temperature for the Period of 1961-2009 (°C)
Figure 7-2-4	Agro-Ecological Regions of Sindh
Figure 7-2-5	Agro-Ecological Zone
Figure 7-3-1	Cropping Patterns of Major Crops in Sindh

Figure 7-3-2	Irrigation Network in Sindh
Figure 7-3-3	Surface Salinity in Canal Command Areas
Figure 7-3-4	Groundwater Depth in the Irrigated Areas (Pre-monsoon 2010)
Figure 7-3-5	Groundwater Quality in Sindh
Figure 7-4-1	Distribution of Cropped Area in Sindh in 1995/96 and 2008/09
Figure 7-4-2	Cropping Layout of Small Scale Crop - Livestock Mixed Farming System (1)
Figure 7-4-3	Cropping Layout of Small Scale Crop - Livestock Mixed Farming System (2)
Figure 7-4-4	Cropping Layout of Middle Scale Crop - Livestock Mixed Farming System
Figure 7-5-1	Distribution of Milk Production Volume for Each Type of Dairy Farmers
Figure 7-5-2	Distribution of Milk Production by Area
Figure 7-5-3	Milk Production of Milk Selling HH and Self-consuming HH
Figure 7-5-4	Number of Animal and Breeder Differ Herd Size (Kundhi)
Figure 7-5-5	Ratio of Animal Differ Herd Size (Kundhi)
Figure 7-5-6	Number of Animal and Breeder Differ Herd Size (Red Sindhi)
Figure 7-5-7	Ratio of Animal Differ Herd Size (Red Sindhi)
Figure 7-6-1	Distribution of Livestock Facilities
Figure 7-6-2	HS Vaccine Bottle Produced at the Vaccine Production Unit
Figure 7-6-3	ETV Vaccine Bottle Produced at the Vaccine Production Unit
Figure 8-1-1	Milk Distribution Channel in Karachi
Figure 8-1-2	Major Milk Supplying Areas to Large Cities
Figure 8-1-3	Milk Collecting System of Engro Foods
Figure 8-1-4	Major Constraints for Milk Retail Shops
Figure 8-1-5	Recycling Dairy Animals
Figure 8-1-6	Major Livestock Flow through Livestock Markets
Figure 8-1-7	Major Concerns of those who use Livestock Market
Figure 8-1-8	Cured skins: Skins are preserved in salt a village or town, and sold to buyers
Figure 8-1-9	Imported and Exported Volume of Milk
Figure 8-1-10	Imported and Exported Volumes of Beef
Figure 8-1-11	Imported and Exported Volumes of Buffalo and Cattle
Figure 8-1-12	Major Countries Exporting Beef to UAE
Figure 8-1-13	Major Countries Exporting cattle to Lebanon
Figure 8-1-14	Imported and Exported Volume of Mutton
Figure 8-1-15	Imported and Exported Volume of Sheep and Goat
Figure 8-1-16	Major Countries Exporting Mutton to Saudi Arabia in 2007
Figure 8-1-17	Major Countries Exporting Goat/Sheep to Oman
Figure 8-1-18	Camel Business
Figure 8-1-19	Imported and Exported Volume of Camel
Figure 8-1-20	Major Countries Exporting Camel Meat to Qatar
Figure 8-1-21	Major Countries Exporting Camel to Qatar

Figure 9-1-1	Collective Activities and Social Relationship among the Community People, Lakhadino Unhar village, Badin
Figure 9-6-1	Work Allocation Among Female Household Members
Figure 9-6-2	A Range of Women's Acting Areas without (free from) Men's Acceptance
Figure 9-7-1	Active Borrowers and Loan Portfolio of Microfinance in Sindh
Figure 9-8-1	Per Capita Annual Cash Consumption Expenditure
Figure 9-8-2	Per Capita Annual Cash Consumption Expenditure: Excluding Large Landowner in Irrigated Area
Figure 9-8-3	Per Capita Annual Total Consumption Expenditure
Figure 9-8-4	Annual Consumption Expenditure by Component
Figure 9-8-5	Sources of Income by Household Group
Figure 9-8-6	Value of Asset Holdings by Different Type
Figure 9-8-7	Lorenz Curves for M.S.S
Figure 9-8-8	Lorenz Curves for Pabuhar
Figure 9-8-9	Relation between Scale of Milk Production and Propensity to Sell
Figure 9-8-10	Percentage of households by propensity to sell for scale of milk production
Figure 9-9-1	Number of Households Engage in Livestock Sharing (M.S.S)
Figure 9-9-2	Number of Households Engage in Livestock Sharing (Pabuhar)
Figure 9-10-1	Flow of Milk Transaction in M.S.S Village
Figure 9-10-2	Flow of Milk Transaction in Pabuhar Village
Figure 9-10-3	Flow of Live Animal Transaction in M.S.S Village
Figure 9-10-4	Flow of Live Animal Transaction in Pabuhar Village
Figure 9-10-5	Flow of Animal in Livestock Sharing in M.S.S Village
Figure 9-10-6	Flow of Animal in Livestock Sharing in Pabuhar Village
Figure 9-10-7	Relationship between Landholders
Figure 9-10-8	Relationship between Landholders and Non-landholders
Figure 9-10-9	Relationship between Non-landholders
Figure 9-10-10	Relationship between households in the same Biradari groups
Figure 9-10-11	Relationship between households in different Biradari groups
Figure 9-10-12	Stakeholders of Dairy Farms in Landhi Cattle Colony
Figure 10-1-1	Organizational Chart of Livestock and Fisheries Department
Figure 10-1-2	Organizational Chart of Hyderabad District Office (related livestock)

## Abbreviations

AI	Artificial Insemination
ADB	Asian Development Bank
ARI	Agricultural Research Institute
ATI	Agricultural Training Institute
AU	Animal Unit
BBSYDP	Benazir Bhutto Shaheed Youth Development Program
BQ	Blackquarter
BS	Bachelor of Science
BSE	Bovine Spongiform Encephalopathy
CCPP	Contagious Caprine Pleuropneumonia
CDWP	Central Development Working Party
CELDAC	Community Empowerment through Livestock Development & Credit
CG	Community Group
CLEW	Community Livestock Extension Worker
CMT	California Mastitis Test
CO	Community Organization
C/P	Counterpart
CP	Crude Protein
CPI	Consumer Price Index
CVDL	Central Veterinary Diagnostic Laboratory
DAB	Directorate of Animal Breeding
DAH	Directorate of Animal Health (proposed)
DAH	Directorate of Animal Husbandry
DCP	Digestible Crude Protein
DDWP	Department Development Working Party
DE	Directorate of Extension (proposed)
DG	Director General
DGI	Directorate of Genetic Improvement (proposed)
DLPM	Directorate of Livestock Planning and Management
DM	Dry Matter
DO	District Officer
DPP	Directorate of Poultry Production (renamed)
DPVP	Directorate of Poultry Vaccine Production (renamed)
DVM	Doctor of Veterinary Medicine
DVRD	Directorate of Veterinary Research and Diagnosis
EC	Electrical Conductivity
EDO	Executive District Officer

ELISA	Enzyme-Linked Immunosorbent Assay
ET	Enterotoxaemia
EU	European Union
FAO	Food and Agriculture Organization
FCM	Fat Corrected Milk
FCS	Food Consumption Scores
FLEW	Female Livestock Extension Worker
FMD	Foot-and-Mouth Disease
FPA	Farm Production Advisor
GDP	Gross Domestic Product
GIS	Geographic Information System
GOP	Government of Pakistan
GTZ	German Technical Cooperation
HH	Household
HIES	Household Integrated Economic Survey
HS	Hemorrhagic Septicemia
IEC	Information, Education and Communication
IFPRI	International Food Policy Research Institute
IRM	Institute of Rural Management
JICA	Japan International Cooperation Agency
LDDDB	Livestock and Dairy Development Board
LLW	Lady Livestock Worker
LSU	Livestock Unit
MCC	Milk Collection Center
MCP	Milk Collection Point
MDGs	Millennium Development Goals
MOA	Ministry of Agriculture
MS	Master of Science
MTDF	Medium Term Development Framework
MTDP	Mid-Term Development Plan
NGO	Non-Governmental Organization
NRC	National Research Council
NRSP	National Rural Support Programme
NWFP	North-West Frontier Province
OCT	Owner-Cum-Tenant
OIE	World Organisation for Animal Health
OJT	On-the-job Training
PARC	Pakistan Agricultural Research Council
PC	Planning Commission



PCR	Polymerase Chain Reaction
PDA	Pakistan Dairy Association
PDDC	Pakistan Dairy Development Company
PDWP	Provincial Development Working Party
PMSIL	Prime Minister's Special Initiative for Livestock
PMN	Pakistan Microfinance Network
PPR	Peste des Petits Ruminants
PRA	Participatory Rural Appraisal
PRI	Poultry Research Institute
PRSP	Poverty Reduction Strategy Paper
PV	Para-Veterinary Officer
PVPC	Poultry Vaccine Production Center
RDF	Rural Development Foundation
RSU	Reform Support Unit
RTI	Research & Training Institute
SA	Stock Assistant
SAFWCO	Sindh Agricultural and Forestry Workers Coordinating Organization
SAU	Sindh Agriculture University
SCARP	Salinity Control and Reclamation Project
SCCDP	Sindh Coastal Community Development Project
SDC	Swiss Agency for Development and Cooperation
SDMDC	Sindh Dairy and Meat Development Company
SIDA	Swedish International Development Cooperation Agency
SLBAP	Sindh Livestock Breeders Association Pakistan
SLSP	Strengthening of Livestock Services Project
SMO	SCARPS Monitoring Organization
SPO	Strengthening Participatory Organization
SRSO	Sindh Rural Support Organization
TDAP	Trade Development Authority of Pakistan
TDN	Total Digestible Nutrients
TOR	Terms of Reference
TRDP	Thardeep Rural Development Programme
UAE	United Arab Emirates
U/C	Union Council
UHT	Ultra-High Temperature
UNDP	United Nations Development Programme
UVAS	University of Veterinary and Animal Science
VDO	Village Development Organization
VMC	Village Milk Collector

VO	Veterinary Officer
VRI	Veterinary Research Institute
WFP	World Food Programme

Currency Exchange Rate  
PKR 1 = JPY 0.880  
(JICA Official Rate for October 2011)

## **Chapter 5**

### **Outline of the Field Survey**

## Chapter 5 Outline of the Field Survey

### 5.1 Major Subjects and Methods of the Field Survey

#### (1) Major Subjects Covered

The field survey was conducted for various subjects by the Project Team and the counterparts from August 2010 to June 2011. As shown in Figure 5-1-1, the subjects covered were the whole value chain of dairy and meat products from production to sales, and in addition, related policies and development plans, major institutions including the Department of Livestock and Fisheries as well as private sectors, natural environment, socio-economies such as household economy, rural sociology, gender, etc., extension structures and activities, lessons from the past development projects, were included in the survey.

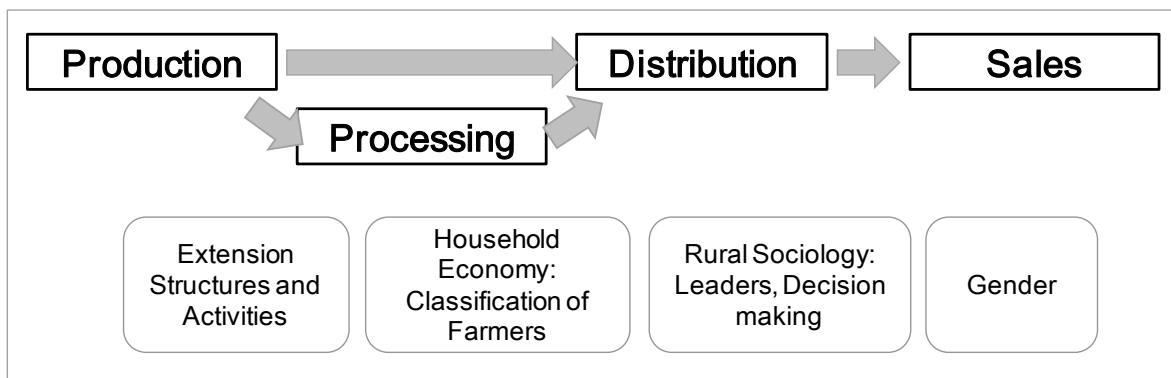


Figure 5-1-1 Subjects Covered by the Field Survey

Some tasks were jointly accomplished with the local consultants. The results are shown in Appendices as follows:

- Livestock disease control: Appendix H
- Marketing: Appendix I
- Extension Services (in Upper Sindh): Appendix K
- Review and Suggestions from Major Related Projects in the Past: Appendix L

#### (2) Household Surveys and Participatory Rural Appraisal

The first household survey was conducted by a local consulting firm in the selected 8 districts, and in total 720 households was surveyed. The interviews were conducted from October to December 2010. Six villages were selected from each district, and 15 households were selected from each village, both of them being based on the criteria prepared by the Project Team. Through the Survey, it is intended to understand main characteristics of the farm households in relation to the number of the animals, the ownership and size of the land they possess as well as agro-ecological and geographical conditions of the areas they reside. The results are shown in Appendix C.

The second household survey was conducted by the Project Team in 1 village each in Badin and Tharparkar from May to June 2011. The number of the total sample households was 250. The intention of the survey was to grasp more concretely the livestock-related household economy of the rural households. In addition to this survey, the participatory rural appraisal (PRA) was conducted at the same villages and the

Landhi Cattle Colony in Karachi. It aims to supplement qualitatively the analysis of the household survey. As a result of the survey and the PRA, the livestock farmers were categorized, and their socio-economic relationships were analyzed. The findings were then reflected for the targeting of the development strategies. The results are shown in Appendix D.

The third household survey was conducted by the Project Team in three villages in Tando Mohammad Khan, Sukkur, and Sanghar between July and August 2011. The number of the total sample households was 150. The purpose of this survey was to grasp the state of agricultural and livestock activities and household economies of large landowners. In order to elucidate their roles and positions within the village they reside, samples households were selected from various categories of villagers including large landowners. In order to further clarify the characteristics of large landowners in Sindh, 15 other landowners in 6 districts were interviewed. The results are shown in Appendix E.

### **(3) Periodical Data Collection**

The periodical data collection, weekly and monthly, was conducted from October 2010 to May 2011. Nine farmers were selected from various areas, as shown in the Project Target Area Map, according to the selection criteria prepared by the Project Team. The sample livestock for data collection were then selected from those of the 9 owners. The number of total sample livestock reached to 79 (12 milking buffaloes, 8 calves, 11 cattle, 30 goats, 7 kids, and 11 sheep). The data were collected through interviews to these owners and observations of these livestock regarding livestock management, physical conditions of the livestock, reproduction, animal health, milk production, livestock facilities, feeds, incomes and expenditures, etc. The results are shown in Appendix F.

### **(4) GIS Data Processing**

The GIS maps were prepared by a local consultant firm based on the information collected by the Project Team. These maps were used particularly for grasping the regional characteristics of the province from various aspects, and for zoning the province for making the livestock development strategies. The maps were prepared at the scale of 1:250,000 with latitude-longitude coordination, and provide information in vector format with several layers.

## 5.2 Assignment of the Project Team

The assignment of the Project Team for the field survey is shown in Figure 5-2-1.

Assigned Area of Work	Name	Company	2010									2011									M/M					
			Japan's Fiscal Year 2010/11						JFY 2011/12			JFY2010			JFY2011			Total								
			7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	Pakistan	Japan	Pakistan	Japan	Pakistan	Japan			
Team Leader/Development Policy	Hiroshi Okabe	KMC		30			54							60		20				84		80		164		
																			(2.80)		(2.67)		(5.47)			
Sub Leader/Rural Economy/Participatory Development 1	Kenichi Machida	KMC		60			43			21				60		20				124		80		204		
																			(4.13)		(2.67)		(6.80)			
Livestock Promotion/Processing	Hideo Toninaga	CDC*		45			60			20				45	15	20				125		80		205		
																			(4.17)		(2.67)		(6.83)			
Livestock Development/Fodder	Yasunori Kanda	CDC		45				45						45						90		45		135		
																			(3.00)		(1.50)		(4.50)			
Livestock Extension 1/Gender	Nobuko Miyake	CDC		29				45			25			45		20				99		65		164		
																			(3.30)		(2.17)		(5.47)			
Livestock Extension 2	Noboru Tsubaki	KMC**					15													15		0		15		
																				(0.50)		(0.00)		(0.50)		
Marketing/Private Sector Development	Funiko Ikegaya	KMC		28				47			16			45		20				91		65		156		
																			(3.03)		(2.17)		(5.20)			
Water Resources/Farm Management	Osami Yasuno	KMC					60								15					60		15		75		
																				(2.00)		(0.50)		(2.50)		
Livestock Health	Arata Koga	KMC		30				45						15						75		15		90		
																				(2.50)		(0.50)		(3.00)		
Statistical Analysis	Yukio Ikeda	KMC												60						0		60		60		
																				(0.00)		(2.00)		(2.00)		
Sindh Society	Kensaku Mamiya	KMC***												13						0		13		13		
																				(0.00)		(0.43)		(0.43)		
Participatory Development 2/Coordinator	Hiroko Matsuki	KMC		60				45			19			46		15				124		61		185		
																				(4.13)		(2.03)		(6.17)		

Figure 5-2-1 Assignment of the Project Team for the Field Survey