

**MINISTRY OF AGRICULTURAL AND RURAL DEVELOPMENT
PROJECT PREPARATION BOARD**

**LIVESTOCK COMPETITIVENESS AND
FOOD SAFETY PROJECT
(LIFSAP)**

**ENVIRONMENTAL MANAGEMENT
FRAMEWORK (EMF)**

April 2009

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PROJECT PREPARATION BOARD**

**Livestock Competitiveness and Food Safety Project
(LIFSAP)**

**Environmental Management Framework
(EMF)**

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ACRONYMS AND ABBREVIATIONS

BOD	Biochemical Oxygen Demand
CDM	Clean Development Mechanism
COD	Chemical Oxygen Demand
DARD	Department of Agriculture and Rural Development
DONRE	Department of Natural Resource and Environment
DPI	Department of Planning and Investment
EIA	Environmental Impacts Assessment
EMF	Environmental Management Framework
ESE	Environmental Supervision Expert
FAO	Food and Agricultural Organization
GAP	Good Agricultural Practice
GHG	Greenhouse Gases
NGO	Non-Governmental Organization
GoV	Government of Vietnam
HACCP	Hazard Analysis Critical Control Points
HF	Hydrogen Fluoride
HPAI	Highly Pathogenic Avian Influenza
HSEMP	Health Safety Environment Management Plan
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
ISO	International Standard Organization
MARD	Ministry of Agriculture and Rural Development
MOF	Ministry of Finance
MOH	Ministry of Health
MONRE	Ministry of Natural Resources
MOSTE	Ministry of Science and Technology
PMU	Project Management Unit
POP	Persistent Organic Pollutants
PSMP	Performance Standard Management Plan
SS	Suspended Solids
ToR	Terms of References
TSS	Total Suspended Solids
VFA	Vietnamese Food Administration
WTO	World Trade Organization

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I. INTRODUCTION

In 2006 the World Bank supported MARD to prepare the Vietnam Food Safety and Agricultural Health Action Plan and it commissioned FAO to conduct on a study on the Competitiveness of the Livestock Sector in Vietnam. The **Livestock Competitiveness and Food Safety Project (LIFSAP)** is the logical continuation of this program of action to address the livestock competitiveness and food safety issues facing Vietnam. The Project is supportive of the government's strategy for the livestock sector, particularly in respect of meeting its production and food safety goals.

With assistance of the Environmental Specialists from the project Preparation Team, MARD's Department of Livestock Production Department has prepared this EMF in order to meet the environmental management requirements of both Vietnamese government and the World Bank. The English version of this EMF has been reviewed and revised based on the comments given by the World Bank.

This Environmental Management Framework (EMF - this document) is prepared in order to set our a framework for environmental assessment, mitigation and monitoring of the potential impacts that will be applied during the implementation of activities under LIFSAP. This EMF includes the followings main contents:

- (i) Existing Environmental legislations of the Government of Vietnam and of the World Bank's Environmental Safeguards policies applicable to LIFSAP.
- (ii) Brief description of the LIFSAP
- (iii) Overview on the Project provinces and cities participating in the Project
- (iv) Potential Impacts associated with LIFSAP's investments and mitigation measures
- (v) Environmental Management Framework (EMF), including environmental screening, assessment and management procedures to be applied throughout project implementation
- (vi) Institutional arrangements for the implementation of the EMF.

Provincial DARDs and DONREs from some participating provinces have been consulted during the preparation of this EMF. The draft English version of the EMF has been reviewed and commented by the World Bank. This final draft version has been revised based on these comments.

II POLICY, LEGAL AND REGULATORY FRAMEWORK

2.1 Vietnamese Environmental Legislations

- Environment Protection Law 52/2005/QH11 passed by the National Assembly on 29/11/2005 regulating responsibilities of individuals and organizations regarding environmental protection.
- Decree 80/2006/ND-CP dated August 9th, 2006 by Vietnamese Government on detail regulations and guidance on the implementation of some articles of the Environment Protection Law;
- Decree 21/2008/ND-CP dated 28th February 2008 revising some articles of Decree 80/2006/ND-CP which also issued a revised list of projects that required EIAs.
- MoNRE Circular N0 05/2008/TT-BTNMT dated December 8th, 2008 by Ministry of Natural Resources and Environment guiding the preparations of strategic environment assessment, environmental impact assessment and environmental protection commitment.
- MoNRE Circular N0 08/TT-BTNMT dated September 8th, 2006 by Ministry of Natural Resources and Environment guiding the preparations of strategic environment assessment, environmental impact assessment and environmental protection commitment.
- MARD Decision No. 23/2007/QĐ-BNN dated 28 March 2007 by MARD providing the lists of usable / banned pesticides in Vietnam

- Ordinance on Plant Protection and Quarantine issued at Decision no 36/2001/pl-ubtvqh10 by the National Assembly on 25 July 2001
- MARD Decision No. 145/2002/QD-BNN dated 18 December 2002 regarding “Procedures for Registration, Production, Formulating, Re-Packaging, Export, Import, Trading, Storage, Transport, Usage, Disposal, Labelling, Packaging, Seminars and Advertisement of Pesticides”.

2.2 World Bank Environmental Safeguard Policies

The proposed LIFSAP has been classified as Worldbank’s Environmental Category B and the following safeguard policy would be triggered:

OP 4.01 Environmental Impacts Assessment

The objective of OP 4.01 is to ensure that the Bank’s financed activities are environmentally sound and sustainable. The World Bank funded projects are screened by the Bank for potential environmental impacts during the project preparation phase. Environmental impacts related to the proposed project activities would be identified and appropriate measures for mitigating the negative impacts would be proposed.

OP 4.04 Natural Habitats

OP 4.04 aims at avoiding or minimising the impacts on natural habitats caused by WB-funded development projects. LIFSAP will not fund any activities that may cause negative impacts on natural habitats including watershed protection forests, natural reserves, biological conservation zones, wetlands, parks protected under decisions issued by the Provincial People’s Committee or other government agencies.

OP4.09 Pest Management

OP 4.09 may be triggered under LIFSAP as some chemicals would be provided for disinfection of farms or flies control related to manure management. All activities including transportation, contact, usage, or disposal of pest control substances or containers carried out under LIFSAP will ensure safety to human and the environment by the implementation of appropriate mitigation measures.

OP 4.11 Physical cultural resources

OP 4.11 was introduced in order to avoid or minimise the potential impacts on physical cultural resources during the implementation of projects funded by the Bank. LIFSAP will not fund any activities that may cause negative impacts on any cultural heritage including temples, pagodas, ancient houses, graves, cultural or historical sites, structures or objects of spiritual importance to local communities, sacred trees or animals, important structures recognised by local community or local authorities. In cases where cultural or archaeological objects are found during the project implementation, chance finding procedures developed for projects will be strictly followed.

III PROJECT DESCRIPTIONS

The Project’s development objective is: *“to improve the competitiveness of household-based livestock producers by addressing production, food safety and environmental risks in livestock product supply chains in the selected provinces.”* The main project beneficiaries will be household livestock producers¹..

¹ These are defined under LIFSAP as those have livestock as their major source of income and the family is providing the majority of the labour required for the enterprise

Project implementation would take place over five years in the twelve 12 provinces and cities including Cao Bang, Hanoi, Hai Phong, Thai Binh, Hung Yen, Hai Duong, Thanh Hoa, Nghe An, Ho Chi Minh City, Long An, Dong Nai, and Lam Dong. Phasing the implementation has been agreed with four provinces and cities including Hanoi, Thai Binh, Ho Chi Minh City and Dong Nai participating in the first 18 months of implementation. Once these provinces have gained sufficient implementation experience and are operating effectively, the remaining eight provinces would be introduced into the program depending on the readiness.

LIFSAP comprises of three components, including:

- Component A: Upgrading Household-based Livestock Production and Market Integration (US\$ 66.2 millions)
- Component B: Strengthening Central Level Livestock Production and Veterinary Services (US\$ 3 millions)
- Component C: Project Management and Monitoring and Evaluation (US\$ 8.8 millions)

Details on project description is provided below, focusing on physical activities funded by the Project:

Component A: Upgrading Household-Based Livestock Production and Market Integration (US\$66.2 millions)

1. Component A is designed to: (a) increase the production efficiency of participating household livestock producers by introducing Good Animal Practice (GAP); (b) providing produce safer meat by upgrading slaughterhouses and meat markets; and (c) reducing environmental pollution by improving livestock waste management practices. The Component will be implemented at the provincial level and will cover selected priority livestock production areas within each of the project provinces. Implementation takes a value chain approach and focuses on improving meat production and marketing chains by linking participating production areas with slaughterhouses and meat markets identified for upgrading by the project. The Component has four following Sub-components:
 - a. Promoting GAP in priority production areas;
 - b. Piloting of Livestock Production Zones (LPZs);
 - c. Upgrading Slaughterhouses and Meat Markets; and,
 - d. Provincial Capacity Building and Monitoring.

Subcomponent A.1: *Promoting GAP in Priority Production Areas.*

The Sub-component would support the introduction of Good Animal Practice (GAP)² to household livestock producers in selected priority livestock production communes in each of the project provinces³. Project beneficiaries would be the more progressive household pig and poultry producers who are willing to adopt GAP procedures designed to improve livestock production efficiency, disease control, food safety and livestock waste management. The program to be financed under this subcomponent includes:

- (a) Extension services for implementing GAP
- (b) Piloting of identification on participating farms for trace back;
- (c) Livestock waste management and bio-securities measures, and

² VIETGAP is a very comprehensive set of procedures and it is targeted at large scale producers with the financial resources necessary to meet the high standards it sets. Since LIFSAP is targeted at household producers, some adjustments would need to be made to be applicable to households' conditions.

³ The priority communes have already been selected in the first four provinces. For the 8 remaining provinces which are expected to commence implementation in PY2, a "risk assessment" study would be carried out to identify the priority production areas and marketing chains to be supported by the project. See Component C for the details of the study that will be undertaken.

(d) Monitoring and certification of GAP farms

Extension for GAP would cover animal husbandry, safe (harmful additive-free) feeding, disease control and bio-security and would be implemented by farmer groups organized by the commune extension worker⁴. First, extension workers and veterinary staff at commune and district levels would receive training in the principles of GAP and the details of each of the GAP interventions in animal husbandry, food safety, disease control and bio-security being promoted. These extension staff, as Master Trainers, would in turn become responsible for training and supervising participating farmers. Based on the training provided, GAP farmer groups are expected adopt good husbandry practices to improve environmental impact and food safety of the livestock and meat they produced. In addition to training, the project would support improved animal health services through the upgrading of the disease reporting system and the provision of veterinary equipment and travel allowances for district staff to ensure there would be adequate veterinary back-up to service the GAP groups⁵. The project would also support improved bio-security by providing household producers with basic personal protective equipment and chemicals (i.e., sprayers, disinfectants, clothing, etc) to contain emergency outbreaks.

A simple livestock identification system would be developed and piloted on household pig farms belonging to GAP groups. In order for a pilot household to participate it would agree to have all their pigs identified with an ear tattoo. The tattoo would consist of a code based on letters and numbers⁶, applied while young pigs are first vaccinated. Meat inspectors would be instructed to monitor the number of animals with identification tattoos passing through their slaughterhouses. The project would supply tattoo application pliers and a set of numbers to each of the para-vets vaccinating⁷ pigs.

Livestock waste management and Bio-security measures. To help encourage participating farmers to adopt good livestock waste management practices, the project would provide farmers with small grants to construct bio-digesters or composting facilities (up to US\$250 per household). Farmer participation would be voluntary through registration with the commune GAP extension worker. Matching grants will be available for private sector activities that can demonstrate substantial public benefits in terms of meeting food safety standards or contributing to animal disease control and bio-security that is considered to be in the collective interest of the household livestock production sector. Eligible for financing would include: (a) the construction of vehicle inspection and cleaning facilities at the entrance to the LPZs or barriers to vehicle entry; (b) a quarantine area/pen on a farm; (c) footbaths and associated chemicals at the entrance to farms and between production sheds; (d) serological testing of compliance with agreed vaccination and feed additive operational procedures; (e) cleaning and disinfection equipment (sprayers etc).

Monitoring and certification. The program is designed to encourage good production practice and part of that process will involve the monitoring of producers' performance and awarding certificates of "good practice" to those households and groups that meet set production, livestock identification, vaccination, and food safety standards⁸.

Subcomponent A2: Piloting of Livestock Planning Zones (LPZs).

⁴ In introducing GAHP procedures, groups are considered to be the best way to deliver extension messages. They also create peer pressure which is essential where high adoption rates are needed to maximize benefits to a community. In LIFSAP these conditions prevail in disease control, waste management and in promoting the safe use of antibiotics and other feed additives.

⁵ Bank funds would not be used to purchase vaccine which is generally provided on a subsidized basis by the government.

⁶ The code would be developed by a national consultant who would also be responsible for holding training programs and demonstration on the technique in each of the participating provinces.

⁷ A set of tattoo pliers and letters/numbers is estimated to cost less than US\$100 and the operating cost is negligible except for the labor needed to apply the tattoo - because the tattoo will be applied at the same time at the first vaccination even that cost is minimal.

⁸ It is proposed GAHP groups would be assessed on annual basis - both within the commune and between communes - and trophies, T shirts, and similar rewards will be handed out to the best performing groups and individuals.

The sub-component would support a pilot program to test the effectiveness of the LPZ development model by financing the establishment, operation, monitoring and evaluation of one pilot LPZs in each of the provinces of Thai Binh, Hanoi and Dong Nai⁹. The beneficiaries of the LPZ program are expected to be progressive farmers. They would be household producers with the capacity to upscale to small or medium scale commercial producers in the medium term. Their participation in the LPZ program would bring their obligation to observe a set of operational guidelines on: vaccination and disease control; improved production practices; and waste management and waste water treatment.

The following activities would be financed under this subcomponent:

- (a) Development of the pilot LPZ: planning and design (including EIA), and small works (i.e., construction/upgrading of roads, electricity, water supply and waste water treatment up to a maximum value of US\$ 5,000/ha).
- (b) Introduction of services to support GAP (animal production, animal health and bio-security)
- (c) Livestock Identification (as presented in Sub-component A1 above)
- (d) Livestock waste management and bio-security measures
- (e) Monitoring and evaluation (i.e., production efficiency, bio-security, and financial, economic and environmental sustainability).

Services to participating households. The services to be provided to LPZ household producers to support the implementation of GAP, are outlined below.

Services to farmers would include: increased disease surveillance by district veterinary staff; serological surveys to verify vaccination coverage and detect inappropriate use of antibiotics and growth hormones; controls on the movement of animals; and, feed analysis to verify true labeling of prepared animal feeds. Support would also be provided for the formation of GAP groups to engage in collective bargaining in the purchase of feed and other production inputs and in developing more secure marketing arrangements with livestock traders. Veterinary station staff servicing the LPZs would receive refresher training in preventive disease control and basic epidemiology.

Support to livestock waste management and environmental protection in LPZs would include: (a) technical assessment of waste management needs; (b) incentive payments for the construction of bio-digesters and animal waste management facilities constituting up to 25% of the cost of construction and equipment (with a cap of \$900); and, (c) initial baseline assessment, ongoing monitoring and final evaluation of the effectiveness of the environmental protection measures. Each of the pilot LPZs would be subject to an Environmental Impact Assessment (EIA) prior to approval for investment.

Evaluation of the LPZ model. A system of data collection and analysis would be supported by the project¹⁰. The project would finance: (a) the development and implementation of a farm-based recording and reporting system; (b) survey and assessment leading to detailed evaluation of the LPZ model in terms of - production efficiency, bio-security, and its financial, economic and environmental sustainability; and (c) workshops to review the results of the evaluation. If the findings of the evaluation confirm the sustainability of the LPZ concept, the project would support additional LPZs on a case by case basis.

Sub-Component A.3. Upgrading Slaughterhouses and Meat Markets.

This sub-component links GAP in key production areas under subcomponent A1 with improved hygienic slaughterhouses and wet markets in the project provinces along their meat value chains. The subcomponent would support the following:

⁹ The criteria for selecting these LPZs and the operational procedures have been included in the Project Implementation Manual. Assurances have been received that the zoning and planning process and the selection of households for participation will be transparent and carried out in close consultation with the households and communities concerned. Land transactions would be by direct negotiation between the parties concerned.

¹⁰ The PPMU will be responsible for collecting LPZ/farm level data which will be evaluated at DLP at national level

- a. The upgrading of slaughterhouses;
- b. Improved meat inspection services; and,
- c. The upgrading of meat markets.

Upgrading of Slaughterhouses. Existing slaughter practices are carried out on the floor with little or no consideration for hygiene and safe meat handling. Carcasses are contaminated with waste water effluent and portioned on wooden surface which are impossible to disinfect. Slaughter men are largely unaware of the need for hygienic practices. The project would renovate existing, or construct new slaughter facilities to provide a meat-safe link in the meat value chain covering project LPZs. Items eligible for project's funding include: (a) the design work necessary to bring the facility to an acceptable operational standard; (b) upgrading the water supply; (c) improvements to ante-mortem and postmortem inspection areas (lighting, inspection pens and quarantine pens); (d) installation of overhead carcass transport rails, or the provision of dressing cradles and hoists necessary to get carcass dressing off the floor; (e) livestock waste treatment facilities¹¹; and, (d) materials and equipment necessary for improve hygiene and bio-security (pressure sprays, livestock transport cleaning areas).

Each of these investments would be accompanied by behavior change training programs conducted by DARD. This training would be designed to change the way in which traders, slaughterhouse management, slaughter men, veterinary inspectors, and the transporters of meat deal with bio-security, disease control, and meat hygiene and food safety. As a condition of receiving assistance each of the facilities supported would be subject to regular inspection to ensure that hygiene standards and safe operational procedures are being maintained.

In the case of privately owned facilities, the project would finance the procurement of essential eligible items of construction or equipment up to a ceiling of US\$ 30,000 per slaughter facility in order to achieve a satisfactory level of meat safety and operational hygiene. The financing of these facilities would be conditional on the owners entering into a binding agreement with DARD to maintain acceptable operational standards in the future and a commitment from DARD to suspend the slaughtering facilities operations in the event that satisfactory operational standards were not being maintained. Facilities that are operated on a community basis or owned by government would be financed fully by the project and the same operational guidelines would apply.

Improved meat inspection service. The project would support the comprehensive upgrading of provincial meat inspection services with technical backing from DAH at the national level. In each participating province, the project would finance (a) a review and development of improved operational guidelines and regulations; (b) training of key veterinary meat inspectors at provincial and district levels; (c) essential equipment, laboratory tests of samples taken at slaughterhouses and incremental operating costs for veterinary inspectors¹² to ensure maximum coverage of slaughtering facilities; and (d) upgrading of the reporting system. Particular attention would be paid to ensure that both anti-mortem and post mortem inspections are carried out in a rigorous manner and action is taken when disease or contamination is identified.

Meat markets: Meat in existing meat markets is sold from wooden tables or hung from suspended hooks without consideration for cleanliness. Markets cements floors, if present, are often broken and drain poorly. Water supplies for cleaning may be absent. The project would make improvements to participating meat markets by upgrading building structures and floors, improving drainage, introduce

¹¹ Subsidies would be provided for the installation of waste water treatment systems, and technical assistance would be provided to introduce better water management practices.

¹² Knives, protective clothing and sampling equipment.

water supplies, and meat counters with stainless steel surface to allow cleaning and disinfection. The project would also address market management issues such as: centralizing the cleaning processes; improving inspection services; and training market management and meat stallholders in the hygienic methods of handling meat. The criteria for selecting meat markets to be financed under the project and the hygiene standards expected to be achieved are presented in the Project Implementation Manual

Sub-Component A.4: Provincial Capacity Building and Monitoring

This sub-component would improve the capacity of DARD and DONRE to support activities in the project province, including: bio-security; food safety, meat inspection and livestock identification (for DARD) and the design and implementation of livestock waste management systems and the monitoring of environmental pollution caused by livestock waste (for DONRE). Training courses will be provided in waste management, epidemiology, food safety, meat inspection and safe and efficient feeding of livestock. The project provinces will be supported by the national level in waste management, environmental protection, farm bio-security and the assessment of the GAP process. The project would support programs to monitor: (a) pollution caused by livestock waste; (b) safety in the food production and marketing chain; and, (c) the quality and safety of livestock feeds.

The Sub-component also provides for the development and implementation of a public awareness program and a “hot-line” service through which issues relating to food safety, livestock disease control and the meat inspection service can be reported..

Component B: Strengthening Central-Level Livestock and Veterinary Services (US\$3 million).

Sub-component B.1: Strengthening the Capacity of Livestock Production Department

The subcomponent would support: institutional strengthening; policy development; and, the development of a public awareness and information system, within DLP. These initiatives are designed to assist DLP to fulfill its role in providing technical leadership and implementation support to the provincial programs, including: livestock waste management; the rollout of GAP for household producers; and, procedures to inform producers of feed quality and true branding of prepared livestock feeds.

The Sub-component would provide technical assistance (TA) to support the establishment of a Livestock Environment Division and to strengthen of regulations and standards for livestock waste management. National and international technical assistance would also be provided for policy development and piloting innovative approaches to livestock development planning; breeding quality certification; and, true labeling of livestock feed quality.

In addition TA would be provided to review GAP procedures and establish a certification process for household producers. The system currently being promoted by MARD is very comprehensive and designed to address the needs of large-scale producers with the financial resources to meet much higher standards than the household producers can achieve. The consultant would review VIETGAP and design a system appropriate for the household livestock producer and develop a methodology for monitoring and certification. The consultant would hold training sessions in each of the project provinces to train DARD and commune staff in the implementation of the new GAP certification. Once these systems are in place, DLP is responsible for monitoring and analyzing results and in updating the GAP procedures to meet the changing needs of the livestock industry – particularly the household producers.

DLP’s data collection and dissemination capacity would be upgraded by establishing a public awareness program to disseminate information on food safety but also on livestock and feed markets, bio-security issues, GAP and technical aspects of livestock production, processing and marketing.

In addition, DLP and DAH would both be responsible for developing or updating, guidelines and regulations relating to the key areas of: bio-security; livestock disease control; livestock waste management; the quality of livestock feeds; the sale and use of feed additives; hygiene standards and meat inspection in slaughterhouses; and measures to improve the safety of meat along the production and supply chain until it enters the retail markets. The two agencies would play a crucial role in ensuring meat safety standards are consistently applied and adopted on a nationwide basis, not just province by province.

Subcomponent B 2: Support for DAH enhancing animal disease surveillance and control.

2. The subcomponent will support DAH to fulfill its central leadership role in animal health and bio-security within the livestock production and marketing system. Under the Sub-component, the following activities would be financed:-

- a. Improving surveillance of livestock disease and food contamination and upgrading of reporting and data processing capacity
- b. Upgrading of meat inspection services and review of training procedures
- c. Strengthen food/meat hygiene monitoring capacity - strengthening National Veterinary Center for Hygienic Control No.1 (Hanoi) and No.2 (HCMC), to measure residues of antibiotics and growth hormones in meat and livestock feeds.
- d. The development and field testing of improve procedures/protocols for: a) livestock identification and trace-back procedures; (b) bio-security measures for household producers on pilot LPZs and priority production areas; and (c) investigation of the occurrence of zoonotic diseases and the measure to counteract them

Component C: Project Management and Monitoring and Evaluation (US\$ 8.8 millions).

3. The component would provide the required resources to: (a) enable the project to be effectively managed; and, (b) to strengthen institutional capacity in key areas, particularly at provincial, district, and community levels, to monitor and evaluate project activities and sustain project interventions. It includes two subcomponents: (a) project management; and (b) supports to monitoring and evaluation.

IV OVERVIEW ON THE PROJECT AREA

The Ministry of Agriculture and Rural and Development selected and proposed 12 cities and provinces to participate in the LIFSAP including Cao Bang, Ha noi, Hung Yen, Hai Duong, Hai Phong, Thai Binh, Thanh Hoa, Nghe An, Lam Dong, Dong Nai, Ho Chi Minh city and Long An. Four cities and provinces namely Ha noi, Thai Binh, Ho Chi Minh city and Dong Nai will participate in the first phase of the Project.

4.1 The Country

Vietnam has a total land area of 331,040 km². Administratively, the country is divided into 65 cities and provinces. Hanoi is the capital city while Ho Chi Minh City has been the country's top economic centre. Below is some information about the cities and provinces participating in the first phase (eighteen months) of the Project.

In 2008, although the livestock sector of Vietnam faced to many difficulties of livestock diseases, high prices of animal feed and the impact of economic crisis, it still remained its livestock sector value total growth rate of 6%. The production total of live weigh was 3.4 million tons, increased 7% compared the year of 2007. The inventory of some key livestock was 26.7 million pigs, 6.4 million cattle, 247 million poultry.

4.2 Ha noi Capital

Ha Noi is located along the banks of the Red river. From 1 August 2008, the city has been expanded to cover the entire former Ha Tay province, Me Linh district of Vinh Phuc province, and four communes of Luong Son district, Hoa Binh province. Ha Noi is located in the Red River Delta, from 20°23' to 21°23' North and 105°15' to 106°03' East. Ha Noi is bordered with Vinh Phuc and Thai Nguyen provinces to the North, with Ha Nam and Hoa Binh provinces to the South, with Bac Giang, Bac Ninh and Hung Yen provinces to the east, and with Hoa Binh and Phu Tho to the West. Hanoi covers an area of 3.3 millions square kilometers, with a population of 6.23 millions people. National highway No.1 runs from Hanoi to Ho Chi Minh City, highway No. 6 joins Ha Tay with North-Western part of the country.

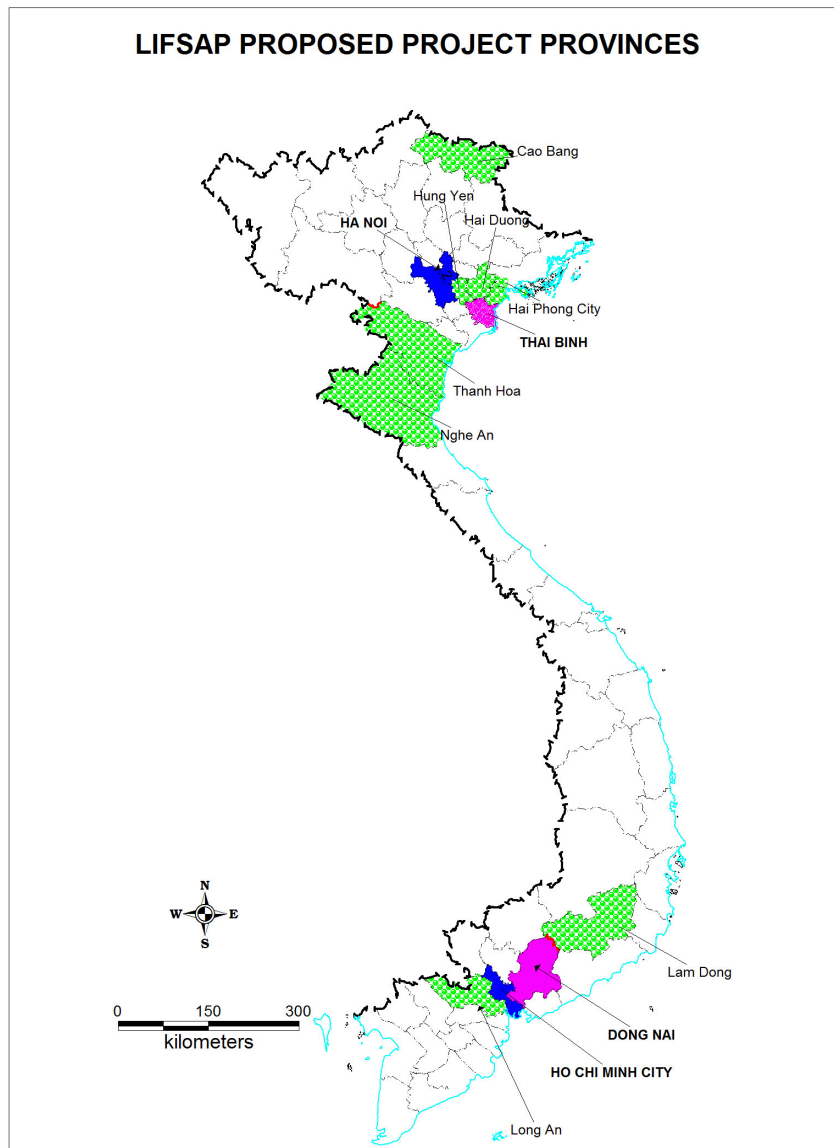


Figure 1 – Locations of LIFSAP provinces

In 2008, Hanoi had approximate 2.09 millions pigs, 276,472 cows, 36,973 buffalos and 17.7 millions poultry. Pigs have been raised in 457,000 households (averaged 3-4 pigs/households) and larger scale

farms with average size of 64 heads. Former Ha Noi has been one of the participating province of the Biogas Project.

In Hanoi there are 6 commercial swine slaughter houses and the other two at the same scale for poultry. The remaining more than 200 slaughter houses have been operating in residential areas in ways and conditions that hygiene and environmental standards and requirements are not met. By 2007 Hanoi PPC approved five project to build commercial slaughter houses but all of them have been delayed¹³.

Meat transportation on motorbikes account for 91% to 98% and only 22% slaughterhouse have separate entry and exit¹⁴

4.3 Thai Binh Province

Covering an area of 1,542 km², Thai Binh makes up 0.5% of total land area of Vietnam. Thai Binh is located in a flat area (slope<1%). Population is estimated at 1,827,000 people, among which rural population accounts for 94,2%. Population density is 1,183 people/km². The province borders within the Gulf of Tonkin to the east, with Nam Dinh and Ha Nam provinces to the south and southwest, with Hai Duong, Hung Yen to the northwest, and with Hai Phong City to the north. Thai Binh is located in the Red river delta and is close to the northern focus Hanoi - Hai Phong - Quang Ninh economic triangle.

Pigs account for 72% of Thai Binh's total livestock production. The province's livestock production plan focus on household farms and prioritize food safety. Livestock production planning goes along with improved waste management from farm level to slaughtering house and markets. In 2008, this province had 1,023,062 pigs, 64,178 cattle and 7,962 millions poultry.

4.4 Dong Nai Province

Dong Nai is a south – eastern province of Viet Nam, with an area of 5,894.73 km², accounting for 1.76% of the nation natural area or 25.5% of the South - eastern natural area. Population to the 2006 is 2,254,676 with a density of 380,37 people/km². It has 11 dependent administrative units. Dong Nai is situated on the economic hub of southern Viet Nam and bordered by: East by Binh Thuan Province; North-east by Lam Dong Province; North-west by Binh Duong and Binh Phuoc Provinces; South by Ba Ria-Vung Tau Province; and West by HCMC. Dong Nai province has an advantage traffic system with many backbone national roads crossing such as: National route 1A, national route 20, National route 51, North – South railway lines.

Besides, Dong Nai Province is based essentially on the system of lakes, dams and rivers, of which Tri An Lake with 323 km² and over 60 rivers, rivulets and canals are very favourable for the development of a number of aquatic products: raft – bred fish, bred shrimps. Dong Nai Province has a river density of about 0.5 km/km², but unevenly distributed. Most of rivers and springs are concentrated in the northern region and along the Dong Nai River in the south – western region. The total quantity of water is fairly high: 16.82 x 10⁹ m³/year, which accounts for 80% in the rainy season and 20% in the dry one. Rivers are Dong Nai, La Nga, La Buong, Song Ray, Song Xoai, Thi Vai.

Dong Nai was one of the provinces that had more than one million pigs in 2008 (1,024,261 pigs). The respectively inventory of cattle and poultry was 90,181 and 5.925 millions.

¹³ Sa Ha, "The country has only 3.6% commercialised slaughterhouses" (in Vietnamese), <http://vinabao.blogspot.com/2008/10/c-nc-ch-c-36-c-s-git-m-tp-trung.html>

¹⁴ Saigon Giaiphong newspaper website, <http://www.sgpp.org.vn/moitruongdothi/2007/10/123718/> "65% slaughter houses do not have wastewater treatment facility"

4.5 Ho Chi Minh City

Ho Chi Minh City is located at 10°45'N, 106°40'E in the south-eastern region of Vietnam. Ho Chi Minh city is 1,760 km south of Hanoi. The average elevation is 19 meters above sea level. It borders with Tay Ninh and Binh Duong provinces to the north, Dong Nai and Ba Ria-Vung Tau provinces to the east, Long An Province to the west and the South China Sea to the south with a coast of 15 km in length. The city covers a land area of 2,095 km², extending up to Cu Chi district and down to Can Gio on the East Sea coast. Like Dong Nai, the climate is characterized with two distinct seasons. The rainy season, with an average rainfall of about 1,800 mm annually (about 150 rainy days per year), usually begins in May and ends in late November. The dry season lasts from December to April.

In 2008, Ho Chi Minh City had 286,499 pigs, 3,970 buffaloes and 105,985 cows. Pigs are mainly raised in three suburban districts including Cu Chi, Binh Chanh and Hoc Mon. Most (98.2%) of the total 61,645 dairy cows have been raised at households level. The city's livestock production planning focus breeding.

4.6 Cao Bang Province

Cao Bang province is located in the north east region of Vietnam, bordered with Quang Tay province of China to the north (border line is 311 km long). The province is bordered with Tuyen Quang and Ha Giang to the west, with Bac Kan and Lang Son provinces to the south.

Cao Bang has a total land area of 6,690 km², mostly limes stone mountain mixed with earth hills. The average elevation is 200 m above sea level and higher near the border with China. The province has many dense forests. Administratively, Cao Bang comprises of 13 districts with 189 communes, wards and towns

Cao Bang province has advantages of ruminant production. In 2008, it had 107,124 buffaloes, 123,050 cattle, 36,521 pigs and 2.113 millions poultry.

4.7 Hai Duong Province

Hai Duong province is located in the Red River Delta. The province is bordered with six provinces and cities namely Bac Ninh, Bac Giang, Quang Ninh, Hai Phong, Thai Binh and Hung Yen. The province has a developed transport system comprising of railway, waterway, national and provincial highway.

This province has considerably developed swine and poultry production, creates and develops a number of livestock production partnerships and belongs to the food belt supplying for Ha Noi and Hai Phong city. The inventory of key livestock in 2008 was 629,414 pigs, 6.857 millions poultry and 53,516 cattle.

4.8 Hung Yen Province

Hung Yen province has a natural land area of 932 km² and a population of 1.1 millions people in 2008. The province share border with five cities and provinces including Ha Noi, Bac Ninh, Hai Duong, Ha Nam and Thai Binh.

In 2008, this province had 578,046 pigs, 46,869 cattle and more than 4 millions poultry.

4.9 Hai Phong City

Hai Phong is a coastal city located at 102 km north of Hanoi. Hai Phong City has a total land area of approximately 152 ha. Hai Phong city is bordered with Quang Ninh Province to the north, with Hai

Duong and Thai Binh provinces to the west and the south, respectively, and with the East Sea to the east. Hai Phong City has a dense river system with density from 0.6 – 0.8 km/km².

Hai Phong city had 5.12 millions pigs, 5.5 millions poultry and 165 thousands cattle (GSO, 2008).

4.10 Thanh Hoa Province

Thanh Hoa is located at 150 km south of Hanoi, border with the east sea and three provinces. Administratively, the province comprises of Thanh Hoa City, two district towns namely Bim Son and Sam Son, and 24 districts.

The province has a population of 3.67 millions people. Total land area is approximately 1.1 millions ha. Topographically, the province is divided into three regions:

- mountain (elevation from 600-700 m) and hilly areas (elevation from 150 - 200 m) accounts for 75.4 % of total land area
- flat plains intervented with limestone mountains, account for 14.6% total land area
- coastal plains with elevation averaged from 3 to 6 m runs along 102 km coastal line and account for 10% total land area

Thanh Hoa is located in area with annual rainfalls of 1,600 – 2,300 mm. There are 90 – 130 rainy days each year. Water resource is abundant with four major river systems including Hoat, Ma, Chu and Yen rivers. The province has 484,000 ha of forested land which accounts for 44% total land area. Forests are biological diverse.

This province has advantages of ruminant production of which inventory occupies the second nationwide position, after Nghe An province. In 2008, Thanh Hoa had 227,326 buffaloes, 351,324 cattle, 1,149,624 pigs and 2,63 millions poultry.

4.11 Nghe An Province

Nghe An is bordered with Thanh Hoa in the North with similar physical and climate conditions. Topographically, the province is lowered from northwest to southeast, hills and mountains account for 83% of total land areas. Nghe an has approximately 745,000 ha of forested land.

Administratively, the province is divided into 17 districts, one city and one district town. Population in 2005 is approximately 3 millions people with density at 183 people/km². Nghe An has a dense river system (0.7 km/km²). Large rivers are Lam 9532 km long, 361 km of which cross Nghe An province). The province has a developed irrigation system and water supply meets production and domestic demands.

Nghe An had the largest inventory of runiment livestock in 2008. This province had 296,548 buffaloes, 408,876 cattle, 1.17 millions pigs and 1.26 millions poultry.

4.12 Lam Dong Province

Lam Dong province has in three highlands which are upstream of seven large river systems. Topographically, the province comprises of mostly high mountain intersected by flat valleys. Average elevation is from 800 to 1000m. Total land area is 9,772 square kilometers.

Lam Dong has relatively well-developed waterworks systems with 29 irrigation works and over 190,000 km of irrigation canals have been concerted. Irrigated area in 2005 was 64,000 ha including two rice crops, industrial, fruit trees, vegetation and flowers. Road network has been developed to district centers however not all the communes are yet accessible by vehicles.

Lam Dong province has ecological conditions that are suitable for dairy cattle but current dairy cattle population is not appropriate to its potentials (only 2,786 dairy cattle). The number of other key livestock was 309,406 pigs, 18,530 buffaloes and 2,0 millions poultry (GSO, 2008).

4.13 Long An Province

Long An province is bordered with Ho Chi Minh City and Tay Ninh City to the south, with Cambodia to the north, with Dong Thap province to the west, and with Tien Giang province to the south. Long An is affected by irregular semi tidal from the East sea through the Soai Rap river mouth.

Long An had 14,497 buffaloes, 90,877 cattles (5,157 dairy cattle), 290,848 pigs and more than 47 millions poultry (GSO, 2008).

V BACKGROUND ON THE LIVESTOCK SECTOR

5.1 Overview

The livestock sector contributes over 21% of agricultural GDP (or 6% of national GDP), of which pig production accounts for 71% of livestock output. The recent increase in livestock production has been driven by rising domestic demand, particularly in urban areas where per capita incomes have risen fastest and the demand for a more varied diet has increased the demand for livestock products. Between 2000 and 2005, consumption of livestock products increased by 7.8% per annum.

Livestock production in Vietnam is mainly characterized by small-scale, widely scattered farms. The size distribution of pig farms is dominated by the very small scale producers with 1-5 sows. **Table 1** below show the number of livestock in Vietnam and average annual growth rate during the period from 2001 to 2007.

Table 1. – The number of livestock in Vietnam during 2001 - 2008

Unit: 1000 heads

		2001	2002	2003	2004	2005	2006	2007	2008	Ave. growth (%)
1	Pig	21,766	23,169	24,885	26,144	27,435	26,855	26,560	26,702	3.0
2	Cow	3,931	4,116	4,469	5,006	5,644	6,624	6,823	6,407	7.2
3	Buffalo	2,807	2,817	2,835	2,870	2,922	2,921	2,996	2,906	0.5
4	Poultry	218,178	233,353	254,129	218,209	219,970	214,564	226,027	247,266	1.8
5	Goat & sheep	572.4	621.9	780.3	1,020	1,341	1,525	1,777	1,341	12.9

(Source: General Statistics Office, Updated to October 2008)

Quite apart from their size, the units are widely scattered throughout the provinces with natural concentrations found on the periphery of urban centers but also extending to the more remote areas where local markets are targeted rather than the larger urban centers.

According to the Department of Animal Health, there are 17,129 slaughterhouses in the country. Small scale household food processing businesses dominate, accounting for about 80% of slaughtering businesses nationwide. 65% of the slaughterhouses do not have wastewater treatment facilities, 72% slaughter houses have been practising slaughtering on the floor or low steps¹⁵ as they are deficient in

¹⁵ Saigon Giaiphong newspaper website, <http://www.sggp.org.vn/moitruongdothi/2007/10/123718/>

physical facility, the equipment used in processing, the utensils used to handle food and also in the food safety knowledge of those working in the enterprises. There are only 3.6% commercial slaughter houses, mostly distributed in the South.

5.2 National Strategy on Livestock Development to 2020

The National Strategy on Livestock Development to 2020 has been approved by the GOV PM on 16 January 2008 with the following guiding principles:

Box 1 – Guiding Principles of the National Strategy on Livestock Development to 2020

1. To develop the livestock production become the commodity production, step by step to meet the demand of foodstuff for domestic consumption and exportation
2. To reorganize the livestock production forwarding the linkage between production and market, ensure the safe of disease, veterinary hygiene, **environment protection and improvement of social welfare conditions**, in order to increase the productivity, quality, efficiency and food safety and hygiene
3. To concentrate in development of the livestock products which are having advantage and competitive capacity like pig, poultry, cattle, at the same time with the special locally livestock products
4. To encourage the every organizations and individuals to invest in development of livestock production by farming and industrial system; at the meanwhile support the small holders to transfer gradually the traditional methods to the livestock farm and industrial system.

5.3 Livestock Waste Generation

Environmental concerns regarding livestock waste issues are primarily on pig production as they are raised more intensively and accounts for approximate 70% of the country's livestock production while other animal husbandry farms are usually in small scale and scatterly distributed¹⁶. According to an estimation from DLP, each year livestock production sector generates more than 73 millions tones of solid wastes (including dry manure and unused feed) and 25 to 30 millions cubic meter of wastewater (including liquid manure, urinate and wastewater from cage washing). Among these, about 50% solid wastes (36.5 millions tones) and 80% of liquid wastes (20 to 24 millions cubic meter) has been discharged directly into the environment or used without any treatment. Another research found that parts (26%) of the livestock wastes have been stored for use a fertiliser or treated by biogas (21%). About 12% of untreated livestock wastewater is discharged into fishponds.

Some programs and projects have been and being implemented to address livestock waste and wastewater management issues:

Box 2 –Livestock waste management related programs

“65% slaughter houses do not have wastewater treatment facility”

¹⁶ LIFSAP Project Preparation Document, Lander Mill, November 2007.

➤ **National Biogas Project**

The project was launched since 2003, funded by the Netherlands Government. In the first phase (2003 - 2007) there were 27,000 plants installed throughout 20 provinces, in which some of LIFSAP proposed provinces are involved: Dong Nai and Ha Tay.

The project's target was, by the end of the second phase, 138,000 biogas plants would be installed in more than 50 provinces but focusing on 38 provinces of Viet nam.

Planning for the second phase of this project is on-going which may cover more than 50 out of Vietnam's 64 provinces

➤ **Livestock Waste Management in East Asia project**

Started in 2006, this GEF funded project has been planned to be completed in 5 years. The project aims to reduce pollution to seawaters from concentrated livestock production in three countries Thailand, Vietnam and China. In one of project components, livestock waste management technology demonstration aims to construct cost-effective and replicable waste treatment system in intensified pig farm. The project aims to demonstrate waste treatment system in some of 100 pig farms in Vietnam. LIFSAP's former Ha Tay province (now become part of Hanoi) and Dong Nai are covered in this LMEAP

➤ **GOV National Program for Clean Water and Rural Environmental Hygiene**

Decision 277/2006/QĐ-TTg stated that within the period of 2006 – 2010, animal farms and animal waste must be adjusted to meet the requirement of reducing the pollution to water course and to the environment. In the decision, implementation of biogas plant, new designed animal house (environmental friendly type), list of different projects included improvement 5millions animal houses, which potential budget is of 6,800billion VND.

➤ **Provincial Waste Management programs**

HCMC supports animal farmer 300,000VND per biogas plant (implemented to 6/2003/TTLT/BTC-NNPTNT), the financial support is increased to 1million in 2007. Other provinces such as Long An and Dong Nai also apply the same policy to their farmers.

In Nghe An province, livestock production farmers can be benefited with land lease discount only if they prepare environmental management commitments, limit the use of manure for fish, adopt biogas and only use dried manure for application on crop land or sell it with approval by local authority (Dine Chua district, Dine Hong commune). In 2007, grant amount has increased to 1000000 per household. Other provinces such as Long An, Đồng Nai also applied similar policy.

In Nghệ An province, farmers are entitled to low land lease rates after they have their environmental protection Commitment approved and limit manure released into the environment by measures such as biogas, fish ponds, applied processed manured on crop lands at premissions from local authority (Diễn Châu commune, Diễn Hồng district).

5.4 Existing Institutional Arrangements Related To Livestock Production And Environmental Managemnt

5.4.1 National Environmental Regulatory Agency

At central level, the Ministry of Natural Resource and Environment (MONRE) is the national agency responsible for environmental management in general. At provincial level, environmental management has been decentralised to provincial Department of Natural Resource and Environment

(DONRE), or District Division of Environmental Management which belongs to District People's Committee.

5.4.2 Livestock Waste Management Responsibilities adopted by MARD

MARD, in the role of sectoral management, has also shown their responsiveness to livestock environmental management responsibility. Livestock environmental management responsibility has been assigned to DLP, particularly its Livestock Environmental Division (LED). LED has been officially formed in April 2008 and still being under institutional setting up for operation.

Function and Responsibilities of the DLP's LEMD

Function and Responsibilities of the Livestock Environmental Management Division, - DLP (Decision No. 57/QD-CN-VP by DLP Director dated 24 April 2008)
<p><i>Function:</i> Assist DLP leaders to manage the livestock production sector at national level, and to implement environmental management, products quality and food safety management in livestock sector</p> <p><i>Responsibilities of the division are summarised below:</i></p> <ul style="list-style-type: none"> (a) Prepare strategy, carry out planning, prepare plans and legal documents on environmental management in livestock production (b) Coordinate environmental management activities in livestock production sector, including: <ul style="list-style-type: none"> - Appraise and manage livestock environmental management projects - Set up and maintain environmental database, prepare environmental reports regarding livestock production (c) Environmental Management: Take lead in <ul style="list-style-type: none"> - Preparing national standards applicable to livestock waste treatment - Guiding and monitoring the implementation of environmental protection - Monitoring and inspection compliance to national standards. Coordinate with other agencies in carrying out EIA and proposing mitigation measures (d) Food quality and safety management, from inputs of livestock production; (e) Research; (f) Take part in coordinating agricultural extension activities which also cover environmental protection in livestock production; (g) Take part in livestock environmental protection promotion activities; (h) International Cooperation: propose and prepare international cooperation environmental projects regarding livestock production; (i) Manage public services on livestock environmental management: policy development, provide guidance during implementation; (j) Manage organisations providing public livestock environmental services: policy development, provide guidance and assistance during implementation. (k) Check and carry out planned/random inspections on environmental compliance and take part in addressing complaints <p>The division has been structured with one head, one deputy and specialists that bring the total number of staff to six. To date, two engineers (one in agriculture and one in biotechnology) have been in place and recruitments of additional staff are on-going.</p>

VI CATEGORISING THE ACTIVITIES UNDER LIFSAP

The specific activities under LIFSAP should be divided into three categories below based on the level of potential environmental impacts:

- Category I Category I comprises of the pilot LPZs, which will be further divided into: (i) Category Ia - LPZ having from 1,000 cattle or 20,000 poultry; and (ii) Category Ib - LPZ having less than 1,000 cattle or 20,000 poultry
The budget for investments on LPZs shall not be more than 20% of each province's total investments.
- Category II Category II covers small infrastructure invested by LIFSAP such as construction or rehabilitation of access roads, water and power supply, drainage for LPZ, wet market or slaughtering house, and upgrading of slaughterhouse building and provision of some equipment.
- Category III Category III includes the non-structural works which could have some potential environmental impacts such as support to veterinary services or improving biosafety (disease surveillance, disinfection of farms etc).

Environmental Management procedures that meet existing Vietnamese and the World Bank requirements shall be applied to each project activity category and these are described in Section VIII of this document.

VII POTENTIAL ENVIRONMENTAL IMPACTS

7.1 *Category I activities - Development and Operations of LPZs*

Concentration of livestock production in a concentrated area would pose a significant risk on air, soil and water pollution, disease transmission, on issues regarding biosafety and disease control etc. However, LIFSAP will not invest directly for livestock raising activities in LPZ but pilot support the development of infrastructure for LPZs). During the implementation of the project, EIAs and EMPs shall be prepared for each LPZ to ensure that investments will meet the requirements of both Vietnamese and the World Bank on environmental management.

This Environmental Management Framework identify the general impacts related to livestock production and introduce a framework of mitigation measures that should be implemented. This framework will provide guidance for the preparation of EIAs and EMPs for specific LPZs.

Environmental risks should be considered regarding LPZ could be:

- High water and soil pollution potentials as livestock waste and wastewater contain high contents of nutrients and pathogens
- Livestock production emits greenhouse gases. According to a report prepared MONRE, FAO found that, globally, livestock wastes generates 65% NO₂ which has the capacity to absorb solar energy 296 times higher than that of CO₂. methane and carbon dioxide are also greenhouse gases emitted from livestock wastes
- Bad odour from ammonia and hydro sulphur released during the decomposition of animal urine and manure cause nuisance to the public and may affect public health.
- Higher risk on animal to animal disease transmission
- Risks to human health related to animal to human diseases
- Accumulation of animal manure would lead to concentration of fly
- The use of chemicals/pesticide to control animal diseases may pose some risks to farmers and / or animal
- Animal feed or animal medicines, if it contain toxic substances, would affect consumers' health.

These Environmental risks related to LPZ development and operations are higher when:

- Inappropriate siting of farms and treatment facilities, or selection of the sites are not in line with local authority's long term land use or agricultural development planning. That may lead to encroachments to or cause increased environmental threats to environmental sensitive areas such as natural protected areas, national parks, forest, wet land etc. If the livestock farms are located too close to populated area or areas with intensive other socio-economic development, disease control would be more difficult.
- Manual handling of animal wastes without wearing sufficient protective equipment by farmers
- The farms are located in areas subject to significant flooding. During flood, contaminants from manure and wastewater would be spread out more rapidly and to a wider areas. Control of other environmental risks would also be more difficult. This risk is higher to LPZs located closer to rivers and/or other water sources
- Animal disease outbreaks. Then not only animal can be more easily affected with sickness or deaths but also cause increases environmental pollution risks if sick animals and bodies of death are not treated timely and properly.
- Development of livestock production does not goes along with sound technical solution for adequate treatment of livestock waste, wastewater and odours.

All of the above listed environmental risks have been considered during the Project design. As a result, the Project applies integrated approach and apply pre-cautionary principles in order to minimise the risks, including environmental threats:

- Supports are given to LPZs in the form of a pilot program instead of having it as the main activity as initially designed.
- Support the planning of the LPZs and the preparation of EIAs/EMPs
- Provide public infrastructure to improve sanitation, hygiene conditions and/or livestock waste and wastewater treatment for LPZs
- Provide waste and wastewater management facilities to LPZ, together with awareness raising and environmental management capacity building for the farmers and authorities at various levels.
- Provide training to relevant stake holders on disease control, awareness raising on food safety and supports on feed analysis

7.2 Category II activities – Livestock Infrastructure Development

Infrastructure investments under LIFSAP should cover:

- Upgrade existing access road, construction of water supply, power supply, drainage canal and livestock wastewater treatment systems (structural works)
- Rehabilitate existing buildings of the slaughterhouse, support simple equipment, rehabilitate access roads, building, provision of some equipment for improved hygiene, provision of wastewater treatment
- Rehabilitate wet markets: upgrade/rehabilitate district wet markets, for example reroofing, improve water supply and drainage, etc.

The potential environmental impacts during construction and operation phases related to the above-mentioned investments are predictable described in **Table 2** below. The mitigation measures and

Environmental Management procedures for these structural Works are presented in Attachment 2 of this document.

Table 2. Typical Environmental Impacts of Livestock Infrastructures

	Impact	Description
PRE-CONSTRUCTION		
1	Land acquisition	Construction of infrastructural works may result in the conversion of land use, temporary or permanently. It may disturb household economic activity, source of income and livelihood of affected people. The level of impacts depends on: <ul style="list-style-type: none"> - The land area to be acquired - The number of people/households to be affected - Existing land use conditions
2	Vegetation cover clearance	Limited vegetation clearance may occurs at <ul style="list-style-type: none"> o power supply: at the poles / transformers. Trees within the safety corridors will also be cut off. o water supply system: at the water intake / water sources, along the transmission/distribution pipes and at treatment facilities. o road upgrade: at the borrow pits, along the roads Removal of vegetation cover removal would increase erosion potentials and dusts generation into the air. The level of impacts depends on: <ul style="list-style-type: none"> o land area to be cleared o density of existing vegetation cover, which associated with the amount of waste to be generated o physical characteristics of the soil
3	Disruption of existing service	Road upgrading, new water and power supply may disrupt or requires relocation of existing structures such as water supply, power lines, telephone cable etc. The level of impacts depends on: <ul style="list-style-type: none"> o the duration of disruption o The quantity of infrastructure to be affected (length of wires/pipes, number of poles to be relocated o Technical complexity for reconnection
CONSTRUCTION		
1	Reduced localised air quality due to dust and smoke	Dusts and smoke from construction sites and surrounding areas, include the areas along materials transportation route affect localised air quality: <ul style="list-style-type: none"> o Smoke from exhaust of vehicles and construction plants and increased traffic in the areas surrounding construction site o Increased dusts level along the road used for transportation of as granular construction materials drop o Dusts from temporary loading of granular construction materials such as sand or stockpile from excavation works o Dusts from construction waste dumping sites The impacts usually last in a relative short time, of low magnitude but can causes nuisances to local people, disturb local daily life. The scope of impacts depends on: <ul style="list-style-type: none"> - The number and frequency of vehicles in use - The quantity of granular materials to be temporarily loaded at a time - The size and adhesivity of the granular materials

		<ul style="list-style-type: none"> - Weather conditions - Toxicity of the materials - The duration and area that granular materials is exposed freely to the air - The number of people /objects affected
2	Increased localized noise level and vibration	<p>Noise and vibration come from</p> <ul style="list-style-type: none"> o Noise from engines of running vehicles, construction plants o Noise from construction activities such as piling, excavation or installation of equipment, loading of construction materials, concrete pouring, drilling <p>Increased localized noise level usually occur in short term, it disturbs sleeps, listening or hearing actives. Long lasting increased noise level may cause headache to some people.</p> <p>The scope of impacts depends on:</p> <ul style="list-style-type: none"> - The number, frequency and working durations of noise sources - Time of the day (night time) - Background noise level - Noise sensitivities of receptor (e.g. farmer's meeting)
3	Water pollution	<p>The most typical impacts on water quality from civil works construction is increased turbidity in water as wastewater or runoff containing high content of suspended solids from construction sites entering water sources.</p> <p>The other sources of pollution are accidental spillage of fuel, lubricants and other chemicals used in the construction process.</p> <p>Wastewater from workers' camp is also a source of water contamination.</p> <p>The magnitude of impacts depends on the amount of contaminants wastewater / runoff entering water bodies, dilution capacity of receptor, as well as the type of water use at affected source, including tolerant range of aquatic species</p> <p>For water supply using ground water, improper casing of the well or sealing of the cases from other water sources would lead to groundwater contamination due to infiltration of polluted surface water or groundwater of lower quality from upper layer into the production layer.</p>
4	Solid waste generation	<p>Excavation may result generation of earth and rock materials. Wastes will also be generated from construction camps/sites. These need to be disposed of off-site.</p> <p>Solid waste generation and dumping occupies land area, depending on the nature of the wastes, they may cause nuisance (odour and leakage) or reduced aesthetic values of the sites, become shelters for disease transmission species (rats, insects etc), increased erosion or causing soil, air and water pollution.</p> <p>The level of impacts related to solid waste generation depends on the extend of construction works</p>
5	Soil erosion /subsident / contamination	<p>The construction of roads, electricity and water supply, and new buildings/structures may require the clearance of sites from vegetation, as well as the execution of excavation works using heavy equipment.</p> <p>Inappropriate construction practices and soil protection measures may induce or accelerate erosion, leading to soil instability and landslides in hilly areas, with possible water pollution due to run-off of bare soil to surface waters (suspended solids, nutrients).</p> <p>It may be anticipated that the clearing of vegetation will lead to temporary increase in soil erosion, until re-vegetation has occurred. The risks of increased soil erosion are particularly prevalent in the hilly regions, like the Northern provinces, and during periods with heavy rainfall.</p> <p>Furthermore, contamination of soils may occur as a result of accidental or</p>

		structural spillage of fuels, lubricant chemicals, sanitary wastewater, etc., as well as from leakage from inadequately protected solid waste storage facilities and sites. Soil erosion may also occur at borrow pits. The risk is higher at steep sites or where the soil strength is low.
6	Disturbance to traffic and daily activities	Road upgrading, excavation for drains, pipes installation and electrical wires may disturb traffic Access and business may be disturbed when the works are carried out at wet market Transportation of heavy/bulky equipment may cause obstructions to local traffic and increase safety risks on roads.
7	Safety and health of the public	Constructions sites, in particular excavations, as well as transportation, movement of heavy equipment and obstructions of roads may cause safety risks to the public. The use of heavy equipment is expected to be limited. However, on the other hand, manually executed works will last longer, resulting in prolonged safety risks. Furthermore, exposed trenches pose fall hazards to humans and animals alike.
8	Occupational health and safety of workers	Construction works unavoidably expose workers to occupational health and safety risks. In particular, the following activities should be referred to: excavations; working with heavy equipment; working in confined spaces; working on and along traffic roads; heavy lifting; storage, handling and use of dangerous substances and wastes; working under noisy conditions.
9	Chance findings	Excavation works at the sites or borrow pits may exposes objects having archaeological / cultural or religious values or explosive materials
10	Social Disturbance	Concentration of workers from other areas would cause social disturbance to the stability of local's social settings and increased the risks of social evils such as gambling or prostitutions. These risks are manageable
11	Damages to local roads	Transportation of heavy/bulky equipment may cause degradation of rural roads, particularly where they are not in good conditions
OPERATION PHASE		
Roads		
1.	Air pollution and increased level of noise	Increased level of dusts, smoke and noise level along the road is unavoidable. However as the roads to be upgraded are the access road to livestock promotion area which is located away from residential areas and other environmental sensitive objects thus the impacts is considered to be low and manageable.
2.	Safety and health of the public	An increase in the number of transportation movements may pose a risk on people living nearby, not only from increased air pollution point of view, but also because of an increased risk of accidents. This impact is manageable
Power Supply		
1	Health risks relating to electrical shocks	Electrical shocks may occur as a result of improper operation of electrical applicants or repairing of power supply systems. Failure of power supply system such as broken wires would also be a threat
Water Supply		
1	Increased wastewater generation	Wastewater in the serviced areas will also be increased as a result of improved water supply. Wastewater have potential to cause local flooding and public health risks if improperly drained / treated
2	Pollution of water source	For water supply using ground water, improper operation or inadequate maintenance of the well would lead to groundwater contamination due to infiltration of polluted surface water or groundwater of lower quality from

		upper layer into the production layer.
3	Mosquito breeding	Storage of clean water also create an environment for mosquito breeding, which is a known source of malaria transmission.

SlaughterHouses and Wet Markets

Construction or installation activities during the upgrading of the slaughter houses or wet market building will have similar impacts to those predicted for the structural works described above and the mitigation measures listed in Attachment 2 would be applicable to minimise these impacts.

Improved infrastructure for slaughter houses may lead to increased slaughtering capacity, which associates with the amount of waste and wastewater generated. Regarding the operations of the slaughter houses, waste and wastewater management, food safety related to slaughtering process, and biosafety within the slaughtering process should be considered. Precautionary and mitigation measures have been proposed in Annex 3 to address such environmental and safety concerns for both slaughter house and wet markets.

7.3 Category III activities - Non-structural Investments

Non-structural investments under LIFSAP may include:

- Provision of veterinary equipment
- Assistance in seri
- Provision of protective equipment and chemicals such as sprayers, disinfectants, clothings to contain emergency outbreaks
- Upgrade meat inspection services and analysis in laboratory and review training procedures
- Strengthening the capacity of the National veterinary Center for Hygienic Control No.1 and No. 2 to carry out feed analysis

Predictions on the potential socio-environmental impacts associated with such investments are discussed in the Table 3 below:

Table 3. Potential Impacts related to goods and services provision
(sampling and analysis)

Risk	Description
Health risks to workers – sampling	<p>Contacts with animals and specimens during sampling would pose a health risks of animal-human transmittable diseases to workers.</p> <p>Workers that exposure to animals for annual serology check might increase risk of acquiring occupational diseases.</p> <p>Unexpected animal reaction when handled wrongly will cause casualty to veterinary para-professionals, farmers (for example a beef cattle weighted 300kg might trample or squeeze farmer badly when being injected)</p>
Waste generation – lab analysis	<p>Analysis of animal specimens will generate wastes, including hazardous wastes from:</p> <ul style="list-style-type: none"> - Cultures and stocks of infectious agents and associated biological, including laboratory waste, biological production waste, culture dishes, and related devices. - Liquid animal waste, including blood and blood products and body fluids, but not including urine or materials stained with blood or body fluids. - Pathological waste: defined as organs, tissues, body parts other than teeth, and fluids removed by autopsy.

	<ul style="list-style-type: none"> - Sharps: Defined as needles, syringes, scalpels, lancets, and intravenous tubing with needles attached regardless of whether they are contaminated or not. - Contaminated wastes from animals that have been exposed to agents infectious these being primarily research animals. - Liquid or semi-liquid blood or other potentially infectious materials; - Contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; - Items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; - Contaminated sharps which includes any contaminated object that can penetrate the skin; - Pathological and microbiological wastes containing blood or other potentially infectious materials. <p>These kind of wastes cause high potential risks for public health if not properly managed or disposed of.</p>
Occupational health and safety of workers – lab analysis	<p>An infection occurs when disease-causing microorganisms enter the human body in sufficient numbers and by a particular route (mouth, skin, eye, lung) and overcome the body's immune system.</p> <p>There is possible high risk in acquiring occupational diseases (bloodborne transmission) for laboratory worker due to improper handling sharp objects: syringes, scalpels, lancets, intravenous tube.</p> <p>Aerosols are created by practices such as filling centrifuge tubes, removing supernatant, and suspending sediment pellets, and the use of blending, cell-disrupting and grinding equipments. The greatest aerosol hazard is created if a tube breaks during centrifugation.</p>

VIII LIFSAP ENVIRONMENTAL MANAGEMENT FRAMEWORK

8.1 Environmental Screening, Assessment and Management Procedures applicable to Category I activities – Investments on LPZs

8.1.1 Screening for Eligibility of LPZs to participate in LIFSAP

In order to avoid the adverse impacts and to minimise the other potential environmental impacts generated from LPZs, the following criteria shall be applied during the implementation of LIFSAP in order to determine the eligibility of a LPZ to be supported with public infrastructure and animal health services by LIFSAP.

A Livestock promotion zone shall not be eligible to be given support by LIFSAP if does not satisfy all of the following conditions:

- It is located at least 3 km from natural protected area, forests or wetland.
- The development of LPZ will not affect any cultural heritages, historical or archaeological sites, to any objects spiritually valuable to local communities such as as temples, pagodas, churches, graveyards, sack etc.
- The land area used for the proposed LPZ is in line with local long-term land use for agricultural development planning
- The LPZ area is not subjected to significant flood risk
- The development of the LPZ does not affect any cultural heritages such as temples, pagodas, churches, graveyards etc.

- It is located at least 1 km from any commune centre, public buildings, schools or clinics, or populated residential areas
- There is sufficient crop land area within LPZ or within 10 km from LPZ for the application of treated manure from LPZ, or there is/are opportunity(ies) for treated wastewater from LPZ to be discharged into agricultural land/irrigation canals/other secondary treatment facility before entering river or other water bodies

Environmental screening shall be carried out by PPMU environmental officer/consultant using the FORM I given in Attachment 1. Screening results shall be submitted to DLP for review and approval, and to the Bank for no-objection. At DLP, the National Project Environmental Consultant should check and verify screening result and recommend to CPMU director for approval.

LPZs not meeting the above-listed criteria shall not be financed by LIFSAP. For eligible LPZs, EIAs/EPCs should be prepared as soon as screening result is approved. Arrangements for EIAs/EPCs preparation will be responsible of DARD and supervised by the National Environmental Consultant.

When a decision on pilot investment on a LPZ is made, the following activities shall be supported by LIFSAP, in parallel with partial investments on infrastructure and equipment:

- Spatial planning and zoning, design of livestock waste and wastewater treatment facilities
- Develop regulations applicable to LPZ to minimise negative environmental impacts
- Recruit and train staff working in LPZ
- Training for farmers on the operation of livestock waste and wastewater treatment facilities, on good manure management practices and records
- Biosecurity investments

8.1.2 Environmental Assessment /Environmental Protection Commitment and Environmental Management Plans for LPZs

According to GOV's Decree No. 21/2008/ND-CP, the following sub-projects are required to prepare Environmental Impact Assessment:

- Slaughter houses capacity from 1,000 animals or from 10,000 poultry
- Livestock production area having from 1000 animals
- Poultry production from 20000 poultries or 200 ostriches
- Fertiliser production, composting capacity from 1000 T/y

Depending of the size of each LPZs, Environmental Impacts Assessment (EIA) or Environmental Protection Commitments (EPC) shall be prepared accordingly. DARD shall contract with a capable environmental consulting company to carry out EIA for LPZs. The EIA shall be subjected to DONRE approval and no-objection from the WB. EPC shall be cleared by the District People's committee.

The reports should follow the standard formats for EIA/EPC regulated by MONRE but not limited to, the following information.

Background Information required for existing LPZs

A map of the area showing the LPZ and surrounding areas. Specify the distance from the LPZ to the nearest:

- water body, including river, pond, lake and connecting channels
- existing/proposed roads
- populated residential areas, protected areas

- natural habitats, if any,
- any known sites having historical/cultural/agricultural values
- any sites with beautiful landscape such as water falls or mountain

Total land area of the LPZ (ha)

Description on the existing land use in the LPZ and surrounding LPZ. Indicate which areas having crop land that can be connected to manure recycling under LIFSAP.

Boundary of the LPZ at four directions

Current Surface and groundwater utility in the area

Flood/drought conditions in the area

Baseline environmental conditions within and surrounding LPZs: air quality, surface water quality, ground water quality.

Existing infrastructure that may be utilised or affected by the LPZ development

Existing livestock production in the LPZ (not applicable to new LPZs)

- describe the locations of existing farms in the LPZ
- The types and number of existing livestock in the LPZ (in detail)
- The number of farms/households using biodigesters or other waste/wastewater treatment facilities
- Current practice on manure handling and management
- Opportunity for manure recycling in the area

Other relevant information collected through desk-study and field investigation

Description on the Investment Proposals on the LPZs

Planning for livestock production in the LPZ (that LIFSAP will assist in planning evaluation):

- The quantity of locations of proposed farms
- The quantity of additional livestock to be raised
- Planning on livestock waste and wastewater management for the new farms, specifying what kind of facilities would be provided, and plan for supplementary manure management

Potential Environmental Impacts Assessment

- Estimate the quantity of livestock waste and wastes to be generated from additional farms/livestock in the LPZs using the guidance given in Attachment 1
- Assess the potentials that increased livestock waste and waster from LPZ can cause soil and water pollution
- Assess the impacts of odour and harmful gas emission from farms/LPZs
- Assess the risks related to:
 - o operation of the waste and wastewater management facilities
 - o Fly development
 - o Animal Pest control
 - o Safety for human related to farm/LPZ operations
- Predict and assess other impacts based on the consultant's own studies and site investigations

Mitigation Measures should be included in EMPs for LPZs

Mitigation measures should be proposed to address all the environmental impacts predicted in the EIA report. The mitigation measures should be related to the following issues:

- Layout planning for LPZ
- Farm layout, including the siting of waste and wastewater treatment facilities
- Design of waste and wastewater treatment facilities
- Livestock waste and wastewater treatment facility - Construction quality assurance
- Biosafety related to livestock production practices
- Safety related to livestock waste and wastewater management operations
- Fly control
- Safety for human and the environment regarding pesticide handling, if the project provide supports to pest management

Details guidance on the mitigation measures to be included into the EMPs for LPZs are included in Attachment of this document.

Environmental Monitoring Program

- Surface water quality monitoring:
 - o Locations: at the discharge point of biodigester and lagoon to ponds, the outlet of LPZ drains
 - o Parameters: COD, BOD, total P, total N, nitrate, total solids and Fecal Coliforms. Note: sampling should be carried out in dry weather
 - o Frequency: twice before construction, should be one in dry season and one in rainy season, then quarterly in the first year of operation, six monthly from the second year.
 - o Responsibility: LIFSAP may support DARD/DONRE with some basic monitoring equipment, or PPMU will sign contract with a capable environmental monitoring firm.
- Ground water quality monitoring:
 - o Locations: at the wells inside and nearby LPZs
 - o Parameters: total P, total N, nitrate, total solids and Fecal Coliforms.
 - o Frequency: at the commencement of LPZ operations and then six monthly.
 - o Responsibility: LIFSAP may support DARD/DONRE with some basic monitoring equipment, or PPMU will sign contract with a capable environmental monitoring firm.

The EIA should estimate the cost for environmental monitoring for each LPZ.

- Compliance to general environmental obligations and safety rules: DARD and independent environmental monitoring consultant should monitor and assess the compliance based on the followings:
 - o Training courses on safety requirements and awareness raising campaigns conducted
 - o Conditions of waste and wastewater treatment facilities
 - o Usage of protective equipment by farmers
 - o Placement of safety warnings signs
 - o Complaints from surround communities/entities
 - o Observe environmental conditions such as odour, fly, disposal of pesticide containers etc.
 - o Responsibility: An independent environmental monitoring consultant will be contracted to carry out six monthly monitoring, at least one should be carried out before the Midterm review.

8.1.3 Description of Environmental Management Procedures for Category I activities - LPZs

Step 1: Environmental management procedures applied to LPZs are illustrated in Figure 2. First, PPMU Environmental Officer shall fill in the screening Form I provided in Attachment 1 of this document and get approval from PPMU Director. Then the screening form will also be sent to PMU Environmental Officer, who will provide technical assistance to PPMU as required, for review and verification.