SFG1922

Kyrgyz Republic

Integrated Dairy Productivity Improvement Project

Environmental and Social Management Framework

Bishkek, March 8, 2016

Content

ABBREVIATIONS AND ACRONYMS

ABCC	Agribusiness Competitiveness Center
AO	Ayil Okmotu (local self-government authority)
APIU	Agricultural Projects Implementation Unit
AISP	Agricultural Investments and Services Project
CDS	Country Development Strategy
CPMP	Community Pasture Management Plan DCPQP Department of Chemicals, Protection and Quarantine of Plants at MOAM
EA	Environmental Assessment
ESMF	Environmental and Social management Framework
EMP	Environmental Management Plan
GDP	Gross domestic product
IDA	International Development Association
KR	Kyrgyz Republic
KRG	Government of the Kyrgyz Republic
MOAM	Ministry of Agriculture and Melioration
NGO	Non-governmental organization
NSC KR	National Statistics Committee of the Kyrgyz Republic
PD	Pasture Department (MOAM)
PUU	Pasture Users Union
PMIP	Pasture Management and Livestock Management Project
PC	Pasture Committee or Jayit Committee (executive body of PUU)
SAEPF	State Agency on Environmental Protection and Forestry under the Government of the Kyrgyz Republic
SEE	State Ecological Expertise
SIVPS	State Inspection on Veterinary and Phyto-sanitary Safety under the Government of the Kyrgyz Republic
SIETS	State Inspection on Environmental and Technical Safety under the Government of the Kyrgyz Republic.
SVD	State Veterinary Department (MOAM)
WHO	World Health Organization

Executive Summary

1. **Project objective.** The Development Objective of the Project is to enhance dairy animal productivity and milk quality on beneficiary farms.

2. **Project components and activities.** The Overall IDPIP (Phases I and II) is composed of the following components:

Component 1: Strengthening Public and Private Services in the Dairy Sector. This component would contribute to the program development objective by improving the public-private dialogue on private sector development issues, and by supporting the improvements in the breed stock (genetic quality) of the dairy cows. This component would focus on the following activities: (i) Improving the Public-Private Dialogue; (ii) Establishment of an OIE-certified Zone Free of Animal Diseases (with a focus on FMD) ; and (iii) Support to AI Service Providers.

Component 2: On-farm Productivity Enhancement. This component would work towards the establishment of Model Dairy Villages. The activities under this component would improve knowledge on good dairy farming practices among direct and indirect beneficiaries, including through demonstrations, and train the beneficiaries in the adoption of necessary inputs, services and equipment. These activities would mostly focus on small and household farms. The project would leverage CAAP's work with business farms (which started in January 2016 and will include demonstrations of good practices), replicate the suitable methodologies, and use the (larger) business farms as demonstration farms to entice the households and smaller farms to adopt good practices. The component would focus on the following activities: (i) Fodder production and feeding management; (ii) Animal husbandry and farm management, including (a) Animal housing, general management and handling; (b) Animal Health, Farm Hygiene and clean milk production; (c) Breeding management; (d) Manure management; and (iii) Milk cooling and handling.

Component 3: Dairy Value Chain Investments. The objective of this component is to promote investments in agribusiness, fostering backward and forward linkages in the dairy value chain and support supply chain infrastructure that create higher value. This would be achieved by providing: (i) a Revolving Fund to facilitate access to finance to small farmer for the purchase of inputs and small equipment, and (ii) technical assistance and capacity building to project beneficiaries, to enable them to access existing financing schemes, such as the credit lines provided by the Kyrgyz-Russian Development Fund. Subject to identification of needs during Phase I, a credit line for investment by farmers, milk collectors, service providers, and agro-processors may be included in the project. The component would be complemented by CAAP's work with financial institutions to build their capacity in financing agriculture, including the dairy supply chain.

Component 4: Project Management. The component would cover the costs associated with project management, including Monitoring and Evaluation, and results assessment. It is expected that project will have two PMUs: the Agribusiness Competitiveness Center (ABCC) reporting to the Ministry of Agriculture and Melioration, and the Credit Line Management Unit (CLMU) at the Ministry of Finance would implement the technical assistance and credit line/revolving fund activities,

respectively. In addition, the ABCC would be responsible for procurement activities under the project, and CLMU for the financial management of the project. ABCC would also open a regional office in Issyk-kul consisting of three specialists: Livestock Specialist, Training Specialist, and Environmental Specialist. Both PMUs would closely liaise with the other projects under the KDSDP program. The Grievance Redress Mechanism (GRM) would be established and maintained by the ABCC.

4. Phase I of the proposed project would cover the following activities:

Component 1: Strengthening Public and Private Services in the Dairy Sector (estimated cost US$ 0.35 million, all IDA). Phase I of this component would focus on the following activities: (i) Improving the Public-Private Dialogue in Issyk-kul; and (ii) Procurement of high quality semen straws to ensure early breeding improvement in the project area.

Component 2: On-farm Productivity Enhancement (estimated cost US$2.78 million, all IDA). During Phase I, the MDV concept would be introduced, determining the locations of the MDV service points, and providing the initial support to these services. The component would start with the most-needed services (which could be a veterinarian, a milking center, a milk collection point, etc.). The component would work predominantly with groups of beneficiaries. The component would provide training, demonstrations and advice to farmers on good animal breeding practices, including: (i) fodder production and feeding management; (ii) animal husbandry and farm management, including (a) animal housing, general management and handling; (b) animal health, farm hygiene & clean milk production; (c) breeding management; and (d) manure management; and (iii) milk cooling and handling.

Component 3: Dairy Value Chain Investments (estimated cost US$1.27 million, all IDA). Phase I would finance: (i) a US$ 1.2 million Revolving Fund to facilitate access to finance for small farmer for the purchase of inputs and small equipment; and (ii) technical assistance and capacity building to project beneficiaries to enable them to access existing financing programs.

Component 4: Project Management (estimated cost US$0.6 million, all IDA). The component would cover the costs associated with project management, including Monitoring and Evaluation for the project implementation, as well as the establishment and maintenance of the Grievance Redress Mechanism (GRM).

5. **Project location.** Most of the project activities (including all investments) will be done in Issyk-kul Region (Oblast) of the country. Some activities, such as improving the regulatory framework for exports will be done at the national level. The grant and sub-project locations will be in rural areas and chosen during the implementation phase.

6. **Project category.** In accordance with the Bank's safeguard policies and procedures, including OP/BP/GP 4.01 *Environmental Assessment*, the project category is B. As during appraisal it is not possible to identify which subproject or grant will be financed, it is necessary to prepare an Environmental and Social Management Framework (ESMF) which would specify all rules and procedures for the matching grants and subprojects EA.

7. **Project potential impacts**. The proposed project activities (investments in improving the animal heard; purchasing of inputs and machinery for feed and fodder production; animal shelter improvement; agro-processing and milk collection and cooling equipment; etc.) might generate a series of various environmental and social impacts. These impacts would be associated with biodiversity degradation, noise, dust, air and water pollution, health hazards and labor safety issues, etc. All of them are expected to be typical for small scale construction/rehabilitation works or for various agricultural processing activities, temporary by nature and site specific and can be easily mitigated by applying best construction and/or agro-processing practices and relevant mitigation measures.

8. **Potential social impacts.** The Revolving Fund sub-financings to be implemented under the on-farm investments will generate a great number of both direct and indirect positive impacts. Direct positive impacts will be generated by increased production in milk production, which would result in creation of new jobs and respectively, and increased income. Indirect positive impacts will relate to overall improving of business environment, introduction of advanced agricultural dairy technologies and techniques, contribution to poverty reduction and food safety.

9. **Environmental and Social Management Framework.** To address these impacts the client prepared an Environmental and Social Management Framework (ESMF) which is aimed at specifying the set of mitigation, monitoring, and institutional responsibility measures to be taken during the project implementation to eliminate adverse environmental and social impacts, offset, or reduce them to acceptable levels. The document provides the World Bank's and national rules and procedures for project Environmental Impacts Assessment (EIA), identify potential environmental impacts of the project (both positive and negative), and outlines rules and procedure for the sub-projects environmental screening, specifying appropriate preventive actions and mitigation measures (including appropriate monitoring plan) to prevent, eliminate or minimize any anticipated adverse impacts on environment. The ESMF was prepared by a consultant based on the following: (i) analysis of the existing national legal documents, regulations and guidelines; (ii) World Bank safeguard policies, as well as other WB guiding materials; (iii) existing ESMFs for similar World Bank projects; and (iv) results of consultations with the representatives of stakeholders and all interested parties. The ESMF also suggests a series of environmental issues to be included in the proposed project TA activities - training, preparing and disseminating guidebooks and implementing demonstrational activities on the following: (a) education of veterinary specialists on managing sector environmental and social impacts; (b); sound manure management; (c) practicing silage production and measures to ensure appropriate handling and disposal of the "silage liquor"; (d) promoting Integrated Pest Management while pproducing fodder and usage of acaricides in livestock production; and (d) TA activities on conducting EA for matching grants and selected subprojects.

10. **Matching sub-financing Environmental Impact Assessment.** The ESMF contains a section on Environmental Guidelines which provides rules and procedures for EA of selected sub-financing under the Component 1, 2 and 3, based on that will be prepared an EMP and/or an EMP Checklist that will be disclosed and consulted in the selected localities as well as submitted to the State Ecological Expertise for their approval.

11. **Implementing arrangements and EA Institutional capacities to perform environmental safeguards.** Ministry of Agriculture and Melioration and the Ministry of Finance will be the

Implementing Agencies for the project. The Agribusiness Competitiveness Center (ABCC) and the Credit Line Management Unit (CLMU) of the Ministry of Finance will be responsible for implementation of the technical assistance and Revolving Fund activities, respectively. The ABCC and CLMU have prior extensive experience in implementing Bank-financed projects. ABCC will be responsible for the environment aspects of the project implementation. The evaluation of the EA institutional capacity has shown that although ABCC has basic capacities to perform its duties concerning EA and enforcing the ESMF provisions, there is need for additional capacity building activities, especially for the new Environmental Specialist to be hired. In this regard the Project will support additional training activities to ensure the environmental requirements and the ESMF provisions would be fully implemented.

12. **Integration of the EMPs into project documents.** The ESMF and EMPs provisions will form part of the design documents for the project, and will be included in contracts for proposed activities, both into specifications and bills of quantities. Respectively the Contractors will be required to include the cost of EMPs requirements in their financial bids and required to comply with them while implementing the project activities.

13**. ESMF disclosure and consultation.** The CLMU and ABCC on February 10 and 16, 2016, have disseminated the draft summary ESMF in Russian and Kyrgyz language in its institutions and to other relevant ministries for review and comments, also posting it for wide public on the web-page of the MoF (http://www.minfin.kg/ru/novosti/novosti/ramochnyy-dokument-po-ekologicheskomu-i-sotsialnom.html) and disseminated through local electronic networks ABCC web-site (http://www.agromarket.kg/index.php?option=com_content&view=article&id=835:2016-02-10-05-27-52&catid=9&Itemid=105). CAREC also posted information on public consultations and ESMF document on its web-site (www.carececo.org (http://www.carececo.org/news/v-filiale-retstsa-kyrgyzstan-sostoyalas-vstrecha-s-konsultantom-vsemirnogo-banka-po-proektu-programm/). On February 26, 2016, the CLMU and ABCC has conducted a public briefing and consultation on this document. Overall the meeting concluded that the draft ESMF document covered practically all potential impacts and possible mitigation measures. The draft ESMF was revised after the meeting taking into account inputs from the consultation. The final version of the EMF was disclosed in the country and in the WB Infoshop and will be used by the government agencies during the project implementation.

Introduction

Project background. Agriculture is an important sector for the Kyrgyzstan economy and livestock farming is a major livelihood support system for the rural people. Agriculture contributes about 20% of the GDP, yet is still a major employer, providing a third of jobs in the economy. It is a key priority for government because of its contribution to poverty reduction and rural employment. Livestock production which accounts for about 50% of the agricultural GDP is dominated by household and small farm production, and is important for rural household food security, nutrition, providing regular income and acting as a social safety net which can be sold in times of hardship and economic distress. Since livestock production prevails in the livelihoods of rural population, recently there has been a steady increase in the total animal population. At the same time, the productivity of livestock farming is significantly below its potential yields. Animal health has deteriorated with the decay of veterinary services, though attempts were made to strengthen this sector. Animals suffer from such wide-spread diseases, as brucellosis, echinococcosis and foot-and-mouth disease, as well as parasites that excessively affect the productivity and profitability of farms and pose a significant risk to human health.

The joint World Bank-IFC Kyrgyz Republic Agribusiness Study[1] (2014) identified that there is no one issue resolution of which would unlock the potential of the sector development. A comprehensive approach is required to resolve the multitude of issues along the value chains to unlock their full potential. The Dairy Sector Development Program is proposed to address the difficulties of the sector and builds on the Bank-supported Avian Influenza Project and Agricultural Investments and Services Project focusing in reforming the veterinary services and establishment of private veterinary services throughout the country; reforms in pasture management and establishment of pasture users unions and pasture committees to manage pastures as common resources; strengthening central laboratories. The Agribusiness and Marketing Project worked with processing companies to improve their technologies, marketing and financial management capacities. IFC's Central Asia Agri-Finance Project is helping introduce new agri-finance lending products and to establish better links between farmers, aggregators and financial intermediaries. JICA has done a study of the dairy sector and is developing A Master Plan for development of the Dairy Sector. The Governments itself is aiming to launch a program on total animal identification, following the Law on Animal Identification passed in 2014 while the FAO has started a small pilot project on animal identification.

Proposed Program financing. The Dairy Sector Development program in Issuk-kul is expected to be financed by a number of financiers (including WBG, DFID, and Government of Austria, other donors, private sector and government). The Program is expected to comprehensively cover all aspects of the dairy value chain from Issyk-kul (cattle breed improvement, animal feed improvement, improvements of animal productivity and milk quality, milk collection upgrades, processing capacity upgrades, food safety standard upgrades, enabling regulatory framework, and export promotion), with the ultimate objective of achieving steady high quality milk exports from Issyk-kul region to Kazakhstan and Russia. The total cost of the program is around US$30 million. Through T&C/IFC and F&M/IFC[2] the DFID and Austrian Government[3] are providing co-financing to work on the dairy sector value chain, focusing on the agro-processing, export promotion and

[1] Policy Note: Improving the Agribusiness Environment in the Kyrgyz Republic; World Bank –IFC; June 2014.
[2] IFC advisory staff mapped to the Finance and Markets and Trade and Competitiveness GPs.
[3] Estimated total financing of about US$15 million equivalent.

regulatory framework. The IDA operation is expected to pull all this efforts together, and focus on on-farm improvements required to ensure high quality milk, as well as necessary public sector investments. The Program will also leverage private sector investments.

Project location. An F&M/IFC-financed feasibility study carried out in February 2015 recommended selecting Issyk-kul Oblast as the suitable site of this pilot dairy value chain intervention, considering the natural barriers for restricting the animal movement, abundance of pasture, farmers' willingness to adopt, existence of direct milk collection system from farmers, less competitiveness between buyers, better milk production growth rates and closeness to Kazakhstan. The Oblasts covers about 330,000 population and 200,000 heads of livestock (approximately 106,000 dairy cows). The study also confirmed that in order to succeed, a comprehensive approach to the value chain development is needed, and proposed four main categories of interventions for the Kyrgyz Dairy Sector Development Program (which includes several projects and sources of financing): (a) Veterinary sanitary protocols, animal identification, data management system and border check posts; (b) Dairy value chain intervention for farmers and agro-processors; (c) Strengthening of State infrastructures responsible for disease diagnosis, disease control, disease monitoring, research and development, vaccine and drug quality control, food quality and safety, farmers' training organization, breeding institutions, OIE accreditation and linkage with International livestock and veterinary Institutions for capacity development; and (d) Policies, regulations, legislation**s** and creating an investment climate and business enabling environment.

Project Environmental Category. In accordance with the Bank's safeguard policies and procedures, including OP/BP/GP 4.01 *Environmental Assessment*, the project is classified as Category B for which an Environmental Assessment (EA) with Environmental Management Plan (EMP) is required. As before Appraisal it is not possible to identify which subproject will be financed the appropriate EA instrument is the Environmental and Social Management Framework (ESMF) which would specify all rules and procedures for the subprojects Environmental Assessment (EA).

Scope of Environmental and Social Management Framework. The purpose of the ESMF is to provide the World Bank's and national rules and procedures for project Environmental Impacts Assessment (EIA), identify the significant environmental impacts of the project (both positive and negative), to outline rules and procedure for the sub-financing environmental screening and to specify appropriate preventive actions and mitigation measures (including appropriate monitoring scheme) to prevent, eliminate or minimize any anticipated adverse impacts on environment. The document has also to specify the implementing arrangements as well as capacity building activities, as needed. Also the ESMF has to suggest necessary environmental TA activities to build the local and national capacity with regard to managing environmental impacts of the dairy sector.

1. Project Description

The Development Objective of the Project is to enhance dairy animal productivity and milk quality on beneficiary farms.

The proposed project would be the first phase of a six year (Phase I and Phase II together) Integrated Dairy Productivity Improvement Project (IDPIP), with the total required funding of about US$ 15

millio. Phase I will ensure initial achievement of the IDPIP objectives, as stipulated in Annex 1, which would then be continued and scaled up during Phase II.

IDPIP would contribute to the overall development objective of the Program which would aim to increase export of Kyrgyz dairy products to neighboring countries (primarily Kazakhstan and Russia), increase incomes of dairy farmers, and create new jobs along the dairy supply chain.

The project beneficiaries would include small household dairy farms located in Issyk-kul Oblast. Of about 100,000 household and family farms located in the Issyk-kul Region, it is estimated that the project activities would reach 12,000 household during Phase I (which is expected to last three years), although a significant number - another 12,000 households - are expected to be reached as indirect beneficiaries. By the end of the Phase I and II (in six years), it is expected that the project will directly reach at least 60,000 households, and indirectly also the remaining 40,000. Given the nature of the proposed project, women and youth are expected to represent at least 70% of all beneficiaries (in household farms, women tend to animals and young people do auxiliary jobs), including at least 60% of female beneficiaries and at least 10% of youth beneficiaries.

The proposed project would support a larger Program which aims at increasing sector productivity and competitiveness, thereby contributing to increased incomes and job creation along selected value chains. The project would be implemented in two phases with the total funding needs estimated at US$ 15 million[4]. This project is the first phase (Phase I) in the amount of US$ 5 million; to be followed by the second phase (Phase II) through Additional Financing instrument. The following description of activities covers the entire IDPIP (Phases I and II), as well as the specific activities to be carried out under Phase I.

Approach. The proposed project would contribute to the implementation of the overall KDSDP, by supporting the necessary public sector investments (such as PPD), as well as private sector investments (such as on-farm investments), to support milk quantity and quality improvement on beneficiary farms. Specifically, the KSDSP approach would include the following elements:

(a) **Creating jobs and increasing incomes along the value chain**. The dairy sector is labor-intensive, and the value addition along the value chain and strengthened linkages between farmers, processors and markets are expected to increase the incomes of farmers and create jobs along the value chain. This would be achieved through partnership building activities along the value chain, including the association of farmers into groups, and providing access to training, knowledge and investments for the value chain participants.

(b) **A strong gender and youth dimension.** Dairy farming is a labor-intensive business and requires family or hired labor. In addition, the milk collection, animal feed preparation and other activities are expected to generate additional employment and, possibly, small business development. Women are a particular focus under the proposed project, as in many cases women tend to the animals (it is quite commonly observed in smallholder dairy systems that two thirds of the husbandry activities are handled by women). The employment generation and small business activities may encourage young people to stay in the villages and take up farming and generate (additional) income through the provision of services (such as grass cutting and fodder

[4] Preliminary estimate, to be confirmed.

preparation, shed cleaning, milk collection and testing, etc.). The project does not envisage any activities separately for men and women. Instead, the project would focus on ensuring equal access to services and training provided under the project for both genders. For instance, the project would ensure that the opening hours of the veterinary services providers are suitable both for men and women.

(c) **Citizen engagement and feedback.** The engagement of the beneficiaries in the project implementation is expected to be strong due to the nature of proposed project. Therefore, transparency, consultations and feedback mechanisms would be a central part of the project. Building of a value chain requires mutual trust between the various stakeholders in the value chain (among the milk producers, as well between producers, processors and traders). Ensuring trust among the project beneficiaries and working towards the same objective will require continuous consultations and information and knowledge exchange. Facilitation of beneficiary engagement and feedback would be a key task of the project staff located in the field. In addition, a feedback mechanism operating at both national and regional levels would allow project beneficiaries to provide feedback on project activities. Feedback/grievances responded and/or resolved within the stipulated service standards for response times will be monitored.

(d) **World Bank Group synergies**. Project design and implementation involves active collaboration within the WBG. The IFC focus on working with agro-processors and building upward linkages to markets: (a) identifying aggregators (dairy companies) and strengthening their capacity to expand, invest and provide services to business farmers; (b) working with financial institutions to increase their capacity to finance dairy supply chains; (c) assisting GOK to improve food safety control by reforming relevant legislation and trainings of public officials; (d) improving the doing business environment and investment attractiveness of the dairy sector by improving the current regulatory environment and introducing new regulations. The possibility of IFC to contribute financing to the proposed project is also being discussed.

(e) **Leveraging other sources of funds. The** KDSDP is expected to be funded by several financiers, including the WBG, the Government of Austria, the Government of Japan, IsDB, DFID, other donors, private sector and GOK (see Table 1). The total cost of the WBG's program is estimated at US$ 15 million. Each donor/participant in the program focuses on a specific area, to ensure efficient use of the funding and complementarity. The World Bank's involvement is crucial for the successful implementation of the program, as it would (a) address the missing linkages between the public and private sector activities already financed under the program, by leveraging the WBG's convening power, and (b) address the financing gap with regards to the quality and productivity of households and small farmers which is a necessary condition to unlock the export potential of the dairy sector. The Program will also leverage private sector investments, in particular from the agro-processing companies and farmers, and financial institutions, as well as government funding, which will mostly support animal identification and registration.

Project area. Issyk-kul Oblast has been selected as the project area based on the results of the feasibility study carried out in February 2015[5]. The study concluded that Issyk-kul Oblast is suitable for dairy value chain development considering its geographical setting (it is surrounded by mountain ranges, which is a natural barrier for restricting animal movement); the abundance of pastures;

[5] Kyrgyzstan Dairy Sector Development Program – Pilot through Zoning – Feasibility Report.

farmers' willingness to adapt and adopt new technologies; the support of the Oblast's Governor's office and local authorities; the existence of a direct milk collection system from farmers; suitable level of competitiveness between buyers; good milk production growth rates; and closeness to Kazakhstan. The Oblasts covers about 100,000 households (rural population of 330,000 people) and 106,000 dairy cows.

The proposed overall Project (Phases I and II) would consist of four components[6]:

Component 1: Strengthening Public and Private Services in the Dairy Sector. This component would contribute to the program development objective by improving the public-private dialogue on private sector development issues, and by supporting the improvements in the breed stock (genetic quality) of the dairy cows. This component would focus on the following activities: (i) Improving the Public-Private Dialogue; (ii) Establishment of an OIE-certified Zone Free of Animal Diseases (with a focus on FMD)[7]; and (iii) Support to AI Service Providers.

Component 2: On-farm Productivity Enhancement. This component would work towards the establishment of Model Dairy Villages[8]. The activities under this component would improve knowledge on good dairy farming practices among direct and indirect beneficiaries, including through demonstrations, and train the beneficiaries in the adoption of necessary inputs, services and equipment. These activities would mostly focus on small and household farms. The project would leverage CAAP's work with business farms (which started in January 2016 and will include demonstrations of good practices), replicate the suitable methodologies, and use the (larger) business farms as demonstration farms to entice the households and smaller farms to adopt good practices. The component would focus on the following activities: (i) Fodder production and feeding management; (ii) Animal husbandry and farm management, including (a) Animal housing, general management and handling; (b) Animal Health, Farm Hygiene and clean milk production; (c) Breeding management; (d) Manure management; and (iii) Milk cooling and handling.

Component 3: Dairy Value Chain Investments. The objective of this component is to promote investments in agribusiness, fostering backward and forward linkages in the dairy value chain and support supply chain infrastructure that create higher value. This would be achieved by providing: (i) a Revolving Fund to facilitate access to finance to small farmer for the purchase of inputs and small equipment, (ii) technical assistance and capacity building to project beneficiaries, to enable them to access existing financing schemes, such as the credit lines provided by the Kyrgyz-Russian Development Fund; and (iii) subject to confirmation during Phase I, a credit line for investment by farmers, milk collectors, service providers, and agro-processors. The component would be

[6] See Annex 2 for the detailed project description.

[7] This will be done in close collaboration with the IsDB, which will focus key components of this activity, including: animal identification and registration in Issyk-kul area; incremental vaccination of cattle; veterinary control posts; and establishment of a regional veterinary laboratory.

[8] The Model Dairy Village (MDV) is designed to ensure proximity of key services and goods for dairy production to farmers. Such MDV is expected to include: a milk collection point, a veterinary doctor/services point, an AI services point, a service center providing access to inputs, medications, farm equipment, training, etc. The proposed project would initiate the establishment of the key service points in the various villages of the Region. The work would be done in collaboration with other donors and private sector players. Depending on the size of the villages, such MDV may encompass one administrative village, or a group of administrative villages, to ensure sufficient demand for the service points.

complemented by CAAP's work with financial institutions to build their capacity in financing agriculture, including the dairy supply chain.

Component 4: Project Management. The component would cover the costs associated with project management, including Monitoring and Evaluation, and results assessment. It is expected that project will have two PMUs: the Agribusiness Competitiveness Center (ABCC) reporting to the Ministry of Agriculture and Melioration, and the Credit Line Management Unit (CLMU) at the Ministry of Finance would implement the technical assistance and credit line/revolving fund activities, respectively. In addition, the ABCC would be responsible for procurement activities under the project, and CLMU for the financial management of the project. ABCC would also open a regional office in Issyk-kul consisting of three specialists: Livestock Specialist, Training Specialist, and Environmental Specialist. Both PMUs would closely liaise with the other projects under the KDSDP program. The Grievance Redress Mechanism (GRM) would be established and maintained by the ABCC.

Phase I of the proposed project would cover the following activities:

Component 1: Strengthening Public and Private Services in the Dairy Sector (estimated cost US$ 0.35 million, all IDA). Phase I of this component would focus on the following activities: (i) Improving the Public-Private Dialogue in Issyk-kul; and (ii) Procurement of high quality semen straws to ensure early breeding improvement in the project area.

Component 2: On-farm Productivity Enhancement (estimated cost US$2.78 million, all IDA)**.** During Phase I, the MDV concept would be introduced, determining the locations of the MDV service points, and providing the initial support to these services. The component would start with the most-needed services (which could be a veterinarian, a milking center, a milk collection point, etc.). The component would work predominantly with groups of beneficiaries. The component would provide training, demonstrations and advice to farmers on good animal breeding practices, including: (i) fodder production and feeding management; (ii) animal husbandry and farm management, including (a) animal housing, general management and handling; (b) animal health, farm hygiene & clean milk production; (c) breeding management; and (d) manure management; and (iii) milk cooling and handling.

Component 3: Dairy Value Chain Investments (estimated cost US$1.27 million, all IDA). Phase I would finance: (i) a US$ 1.2 million Revolving Fund to facilitate access to finance for small farmer for the purchase of inputs and small equipment; and (ii) technical assistance and capacity building to project beneficiaries to enable them to access existing financing programs.

Component 4: Project Management (estimated cost US$0.6 million, all IDA). The component would cover the costs associated with project management, including Monitoring and Evaluation for the project implementation, as well as the establishment and maintenance of the Grievance Redress Mechanism (GRM).

2. Environmental Assessment Policy and Regulatory Framework

2.1 National Environment and Environmental Assessment Regulatory Framework

The main law on environmental protection is the *Law on Environmental Protection (1999, edited on 27 April 2009 N 13)* that establishes basic principles of environmental protection and ensures legal powers in relation to the establishment of environmental quality, marking of preferentially protected territories, publicity of rules and procedures of the natural resources use, establishment of the system of environmental monitoring and control, and fixing the procedures of disaster management. Among the standards and norms of environmental quality authorized within this law, there are the following activities relevant for the current project: (a) norms of maximum safe concentration of hazardous substances in the air, water, soil and subsoil; (b) norms of the maximum safe use of chemicals in the agriculture; (c) standards of the natural resources use; (d) norms of maximum safe level of noise, vibrations and other hazardous physical impacts. The law also establishes requirements on the carrying out environmental assessment of the planned economic or other activities to prevent possible detrimental environmental impacts.

Article 6 stipulates that environmental management in Kyrgyzstan is implemented *inter alia* through establishing environmental requirements for economic and other activities that may have environmental impacts; conducting an EIA and SEE in order to prevent potential negative environmental impacts; payments for use of natural resources; compensation for environmental damage; and environmental restoration. The new stated that EIA is a process seeking to identify, analyze, assess, and consider potential environmental impacts within planning and design of various activities. SEE is defined (in Articles 2 and 16) as a process seeking to determine the level of environmental risk and danger associated with implementing proposed activities and preventing those actions that may have a direct or indirect negative impact on the environment and natural resources.

Article 16 makes explicit the obligatory nature of SEE and prohibits financing and implementation of projects without a positive finding, or conclusion, of the review. The conclusion is to be issued prior to the decision-making process leading to authorization of the intended activity. Articles 17-26 define the ecological requirements for siting, project design, construction and reconstruction, and operation of various economic activities and facilities; urban development; handling of radioactive materials and chemicals; waste management; biological products; military activities; protection of the global climate and ozone layer; privatization; and environmental standard setting and certification. The Law requires that in the process of designing, placing, construction, re-construction, putting into operation facilities, and other activities having a direct or indirect impact on environment, the actions for protection, use and restoration of the environment and natural resources shall be identified and undertaken "according to ecological norms". The Law also requires that an EIA be prepared for a planned activity (Article 17).

The Law on Ecological Expertize (1999, edited in 2003, June 11 (№ 102), 2007, February 26 (№ 21)), constitutes the main legislation related to environmental assessment. Its objectives include prevention of adverse impacts on human health and environment that take place as a result of economic and other activities, and ensured compliance of this activity with the environmental requirements of the country. This law is used extensively in the 'development projects' that could make certain environmental impacts, including: feasibility study and designs for construction, reconstruction, development, retrofitting and other projects irrespective of their estimated cost, origin or type of ownership, which implementation can make environmental impacts. According to this law, the project initiator is responsible for the submission of necessary documentation on the project and its environmental impact to the state environmental expert evaluation (SEEE). The review of the submitted documentation is made by the Expert Committee of SAEPF. Favorable decision of the

SEEE constitutes the prerequisite of the started financing or implementation of a project. A negative conclusion prohibits the project implementation.

The Ecological Expertise Law is a mandatory, objective, comprehensive, integrated, and scientifically justified, independent, transparent assessment process open to public view that takes place prior to decision-making by a relevant authority on implementation of a proposed activity. According to Article 3 of the law, the following are subject to the SEE process: all draft legal and normative acts, international agreements, and instruction documents that regulate economic activity; concepts, complex regional and sectoral development and investment programs and plans; urban development; green-field construction, reconstruction, retrofitting, and decommissioning design and project documentation; agreements and contracts; licenses; technologies; products; natural resources utilization, *etc*. Articles 1 and 10 of the Ecological Expertise Law introduce the concept of an EIA. Public- or private-sector proponents of an activity are responsible for conducting an EIA at preplanning and design phases and for submitting an EIA report, together with other activity-related documentation, for the SEE. An EIA is conducted for the following: concepts, programs, and plans of sectoral and regional social and economic development; environmental protection schemes; urban development; and new construction, reconstruction, technological retrofitting of various economic activities that may have environmental impacts. An EIA report is a mandatory part of project activity documentation that is subject to SEE. It is necessary also to note Kyrgyzstan ratified the 1991 Espoo EIA Convention (in force – 10 September 1997, as viewed on 1/23/2002 at: http://www.unece.org/env/eia/ratification.htm) on 1 May 2001 and acceded to the 1998 Aarhus Convention (in force – 30 October 2001, as viewed on 1/23/2002 at: http://www.unece.org/env/pp/ctreaty.htm) on 1 May 2001.

EIA requirements were first established through the Instructions for Environmental Impact Assessment of Proposed Activities in the Kyrgyz Republic, approved in 1997 by the Minister of Environmental Protection and cleared by the Ministry of Health and the Ministry of Architecture and Construction. The 1997 EIA Instructions took into account provisions of the 1991 EIA Espoo Convention and made 23 types of activities subject to mandatory EIA (Annex 2), while those activities for which EIA was voluntary were listed in Annex 3. In addition, this instruction defines (a) stages of and procedures for EIA preparation; (b) EIA stakeholders; (c) EIA content and documentation; and (d) the application of EIA to policies, plans, and programs.

New Regulation on order for environment impact assessment conduction in the Kyrgyz Republic was approved by Government of KR on 13 February 2015 (*No60*).

Basic requirements for EIA: The 1997 Ministry of Environmental Protection EIA Instructions proclaim in broad terms (a) the responsibilities of EIA stakeholders (*i.e*., an "initiator," or proponent, of an activity or a project; EIA "designers," or experts, responsible for preparing an EIA statement or report; a duly authorized environmental body; and the public); (b) EIA applicability; (c) EIA stages and the contents of an EIA report and other documentation and records, including for (d) public participation; (e) mitigation measures and environmental corrective actions during project or activity implementation; (f) monitoring and control during implementation; and g) post-project evaluation. Additional guidance is provided in Annexes 1-7.

The EIA Instructions stipulated that an EIA had the following stages: (1) notification or declaration of intentions, (2) preliminary EIA, (3) intermediary review by the State Inspection on Environmental and Technical Safety to decide on the need for and the scope of a detailed EIA, and (4) preparation of a detailed EIA and the relevant revision of the project scope. The following issues should be identified, described, and analyzed (in quantitative and qualitative terms) at the preliminary

EIA stage: (a) the area of influence, (b) potential impacts from various alternatives, including from a "zero," or "no project," alternative," (c) potential cumulative impacts, and (d) technical and managerial mitigation measures. A preliminary EIA report should also analyze applicable legislation and available institutional capabilities. In accord with Ministry of Ecology and Emergency Situations guidance, a detailed EIA should be carried out and an EIA statement or report prepared along the line of the preliminary EIA but in greater detail.

According to Instructions 1 and 2 the EIA must include:

- Description of the project or planned activity;
- Possible alternatives for the project or planned activity;
- Description of the existing environment;
- Types and degree of impact on environment and population;
- Forecast any possible changes in environmental quality;
- Description of socio-economic and ecological consequences; and
- Actions to prevent environmental damage or mitigate the level of ecological risk.

Once prepared the EIA is reviewed by the authorized government body on environmental protection (Agency on Environment Protection and Forestry – Department of Ecological Expertise. It should be noted that Instruction 2 is developed in accordance with regulations of the *International Convention on Environmental Impact Assessment in a Trans-boundary Context* and also defines:

- Scope of the EIA application;
- Organization and procedure for the EIA performance;
- Responsibilities and liability of EIA participants;
- Registration of the EIA results; and
- Procedure for public hearing.

The final EIA shall be the statement on ecological consequences of a project or planned activity and contain guarantees for adoption of the actions to ensure protection of the environment and ecological safety throughout the implementation of the project or planned activity.

The supervision of EMP implementation is the responsibility of the State Inspection on environmental and technical safety of the KR (see: http://www.geti.kg/index.php?lang=ru). This body has its regional branches which are responsible for state control in the areas of: labor safety, construction, exploitation of mineral resources, radiation and environmental protection, including on land and biological resources.

Public participation: The Environmental Protection Law proclaims an "openness principle" in Article 3, suggesting "glasnost" in resolving environmental issues within economic and other activities, close relationships with nongovernmental organizations and the population, *etc*. Article 50 declares that every citizen has a right to access environmental information owned by state bodies by requesting such information in writing. State authorities have six weeks to review and make information available for a fee, or they may reject the application in certain cases. Article 45 stipulates *inter alia* the right of citizens to (a) initiate and participate in a public ecological review and (b) to challenge individuals and legal entities in administrative and court proceedings for their decisions related to various economic activities, as well as to demand interruption and closure of any activity that has a negative environmental impact.

Monitoring, enforcement, and compliance: Kyrgyz legislation entrusts the State Inspection on Environmental and Technical Safety as a duly authorized state body, with state environmental monitoring and control and enforcement of environmental legislation. This Inspection and their

regional offices have direct responsibility for ensuring compliance with the provisions of a SEE conclusion, applicable legislation, permits, and standards. Local administrative authorities monitor compliance with their own decisions that originate from applicable SEEs.

The KR Law 'General Technical Regulations on Environmental Safety in the Kyrgyz Republic' is aimed at protecting the environment and identifies main provisions on technical regulation in the area of environmental safety; also, establishes general requirements to ensuring environmental safety while designing and implementing activities at the facilities of economic and other agents for the processes of production, storage, transportation and disposal of produce.

The KR Law on Pastures ensures economically viable and sustainable use of pastures. Pasture use employs an approach based on the involvement of local communities and entailing their participation. It provides a legal framework for the sustainable management of pastures, elimination of the three-tier management and transfer of all functions and powers to ayilokmotu. The main specifics of new legal framework includes: (a) the decentralized management of all pastures till the local level of government with the further opportunity to decentralize it to the level of pasture-users who shall establish the Pasture Users Union (PUU); (b) PUUs develop Community Pasture Management Plans that should be used as the basis for the management, maintenance, improvement and use of pastures; (c) pastures are considered within the framework of ecosystems, and the new law substitutes the rent with the right of use to facilitate the mobility and pasture rotation and ensure fair access to them for all users; (d) fees for pasture use get collected in PUUs and, it is expected, that they will be used for pasture improvement; (e) other users, in addition to livestock farmers, will take part in the process of decision-making and are represented in the Pasture Committee.

The Law on Veterinary (2005) identifies the general, legal, organizational and financial framework of veterinary. The law regulates operations in veterinary in accordance with the international requirements, identifies the legal status and structure of the veterinary service, and establishes necessary veterinary and sanitation requirements and bases of veterinary control. It targets protection of animal health, protection of people from diseases common for humans and animals, ensured production and sale of animal products of high veterinary-and-sanitary quality. Article 7 of the KR Law provides for control by the Veterinary Service over execution of instructions and resolution adopted in regards with prevention and liquidation of hazardous infectious diseases common to animals, Article 28 – for making arrangements for culling and disposal of dead animals in burial holes. Article 34 provides for quarantine measures adopted by the State Veterinary Service, and Article 58 stipulates private veterinary services agreed with the state veterinary services to carry out preventive-veterinary and quarantine-liquidation measures in regards with epizootic, zoonosic and zoo-anthroponosic diseases.

The Law on Agro-chemicals and Protection of Plants (1999) identifies the legal, economic, environmental, social and organizational framework of use of agro-chemicals and plants protection in the interest of protected health of people, animals, environment, prevention or elimination of consequences of soil, vegetation and animal products contamination. In order to implement the Law, there has been adopted the KR Government Resolution 'On the Measures of Environmental Protection and Protection of People's Health from Adverse Effects of Certain Hazardous Chemical Substances and Pesticides' dated 27 July 2001 No 376 that includes the List of Chemical Substances and Pesticides which use is prohibited or strictly limited. In accordance with Article 3 of the law,

there is a ban on the supply and use of pesticides that have not passed registration tests and are not included into the List of Pesticides and Agrochemicals allowable for the use in the Kyrgyz Republic. Also, there was adopted the KR Government Resolution 'On Approved State Catalogue of Pesticides and Agrochemicals Allowable for the Use in the Kyrgyz Republic for 2011-2019'.

The Land Code of the Kyrgyz Republic regulates land relations in the Kyrgyz Republic, origin, procedure of execution and termination of the rights for land and their registration; it also targets the establishment of land-market use in the conditions of state, municipal and private ownership of land, and rational use of land and its protection. The Land Code constitutes the main document that regulates the land-use, but it contains few provisions related to pastures. Nevertheless, it stipulates state ownership of pasture resources. Finally, the Land Code identifies forms of economic activities on agricultural lands.

The law 'On Mountainous Areas of the Kyrgyz Republic' (2002) was developed to establish the social, economic and legal framework for the sustainable development of mountainous areas of the Kyrgyz Republic, protection and rational use of natural resources, the historical, cultural and architectural heritage. The law should become a basis for the regulation of people's activities in mountainous areas.

The law 'On Agricultural Land Management' (2001) regulates legal relations on agricultural land management and targets the ensured efficient and safe use of lands in the interest of people of the Kyrgyz Republic.

The Forest Code of the Kyrgyz Republic establishes legal framework of rational use, protection, conservation and reproduction of forests, improvement of their environmental and resource capacity, their rational use; it also regulates land-use within the State Forest Fund.

The law 'On the Animal World' (1999) establishes legal relations in the area of protection, use and reproduction of the animal world units. The animal world constitutes the asset of the Kyrgyz Republic and an integral element of the nature, a natural resource, an important regulating and stabilizing component of the biosphere, the utmost protected and rationally used for the satisfaction of material and spiritual needs of the citizens of the Kyrgyz Republic.

The law 'On Protection and Use of the Vegetable World' (2001) establishes legal framework for the ensured efficient protection, rational use and reproduction of plant resources.

2.2 The World Bank Safeguards Policies

Overview. The Bank undertakes environmental screening of each proposed project for which it will provide funding in order to determine the appropriate extent and type of environmental assessments (EA). The Bank classifies a proposed project into one of four categories, depending on the type, location, sensitivity and scale of the project and the nature and magnitude of its potential environmental impacts. The four EA Categories are A, B, C, and FI. Category FI is applied to all proposed projects that involve investment of Bank funds through a participating financial intermediary (PFI) to be used for sub-projects of which the environmental impacts cannot be determined during appraisal of the World Bank project.

World Bank's Safeguard Policies and their relevance to project. There are key 10 Environmental and Social World Bank Safeguard Policies which are intended to ensure that potentially adverse environmental and social consequences of projects financed by Bank are identified, minimized and mitigated. World Bank Safeguard Policies have a three-part format: Operational Policies (OP) - statement of policy objectives and operational principles including the roles and obligations of the Borrower and the Bank, Bank Procedures (BP) - mandatory procedures to be followed by the Borrower and the Bank, and Good Practice (GP) - non-mandatory advisory material. World Bank's Safeguard Policies and their relevance to sub-projects to be funded under the Investment Grant Financing Component are indicated in the *Table 1* below.

Table 1. World Bank's Safeguard Policies and their relevance to the project

Safeguard Policies	**Triggered**	**Explanation (Optional)**
Environmental Assessment OP/BP 4.01	**Yes**	This OP is triggered as a series of proposed project activities (upgrading/construction of the veterinary laboratory and installing veterinary posts; investments in improving the animal heard; inputs for pasture improvements; agricultural equipment; farm infrastructure improvement including animal housing, waste management, handling and storage, including demonstration infrastructure in this regard; purchasing of inputs and machinery for feed and fodder production; animal shelter improvement; agro-processing and milk collection and cooling equipment; silage production; etc.) might generate a series of various environmental and social impacts. These impacts would be associated with biodiversity degradation, noise, dust, air and water pollution, health hazards and labor safety issues, etc.). In the case of silage production this might generate significant soil and ground water pollution. All these impacts are expected to be typical for small scale construction/rehabilitation works or for various agricultural processing activities, temporary by nature and site specific and can be easily mitigated by applying best construction and/or agro-processing practices and relevant mitigation measures. To address these impacts the client prepared an Environmental and Social Management Framework (ESMF) aimed at specifying the set of mitigation, monitoring, and institutional responsibility measures to be taken during the project implementation to eliminate adverse environmental and social impacts, offset, or reduce them to acceptable levels. The ESMF also suggests a series of environmental issues to be included in the proposed project TA activities which would include training, preparing and disseminating guidebooks and implementing demonstration activities on the following: (a) education of veterinary specialists on managing sector environmental and social impacts; (b) sound manure management; (c) practicing large and/or small scale silage production and measures to ensure appropriate handling and disposal of the "silage liquor", preventing soil and ground water pollution; (d) promoting Integrated Pest Management while producing fodder and usage of acaricides in livestock production; and (e) TA activities on conducting EA of selected matching grants and sub-projects.
Natural Habitats OP/BP 4.04	**No**	The project will not support any activities that would trigger this policy. Its indirect impact would be reduction in number of animals and respectively reduction of the pressure on the pastures that would beneficial in terms on improving status of NHs.
Forests OP/BP 4.36	**No**	The project will be implemented in non-afforested areas and thus no impacts

		on the forests status are expected.
Pest Management OP 4.09	**Yes**	Although the project will not support purchasing and use of mineral fertilizers and pesticides, the farmers routinely use them while producing animal fodder as well as acaricides to control ticks and other ectoparasites. To ensure their safe usage the ESMF will support TA activities in this aspect, providing public awareness and training for farmers.
Physical Cultural Resources OP/BP 4.11	**No**	The veterinary laboratory selected for rehabilitation is not included in the list of national or local lists of PCR
Indigenous Peoples OP/BP 4.10	**No**	There are no known IPs in the project area
Involuntary Resettlement OP/BP 4.12	**No**	The project will not finance any activities that might trigger involuntary resettlement issues. Any infrastructure constructed under the project will be: (a) located on land already owned by participants, or will be bought or leased on a willing buyer-willing seller basis, and, (b) will be screened to ensure that it is free of legal encumbrance, or informal use or occupation by others who lack formal title.
Safety of Dams OP/BP 4.37	**No**	
Projects on International Waterways OP/BP 7.50	**No**	
Projects in Disputed Areas OP/BP 7.60	**No**	

World Bank Screening Categories and Environmental Assessment Procedures. Environmental Screening is a Mandatory Procedure for the Environmental Assessment 4.01 OP/BP. The Bank undertakes environmental screening of each proposed project for which it will provide funding in order to determine the appropriate extent and type of the Environmental Assessment to be conducted. The Bank classifies a proposed project into one of four categories, depending on the type, location, sensitivity and scale of the project and the nature and magnitude of its potential environmental impacts[9]. These four Categories are A, B, C, and FI.

Category A projects is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may be sensitive, irreversible, and diverse, with attributes such direct pollutant discharges large enough to cause degradation of air, water, or soil; large-scale physical disturbances of the site and/or surroundings; extraction, consumption, or conversion of substantial amounts of forest and other natural resources; measurable modifications of hydrological cycles; hazardous materials in more than incidental quantities; and involuntary displacement of people and other significant social disturbances. The impacts are likely to be comprehensive, broad, sector-wide, or precedent-setting. Impacts generally result from a major component of the project and affect the area as a whole or an entire sector. They may affect an area broader than the sites or facilities subject to physical works. The EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" scenario), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. For a Category A project, the borrower is responsible for preparing a

[9] See: Environmental Assessment Update Sourcebook, Environmental Department April 1993. The World Bank

report, normally a full Environmental Impact Assessment (or a suitably comprehensive regional or sectoral EA).

Category B projects has potential adverse environmental impacts on human populations or environmentally important areas - including wetlands, forests, grasslands, and other natural habitats - which are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A assessment. Like Category A, a Category B environmental assessment examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

Category C. An EIA or environmental analysis is normally not required for Category C projects because the project is unlikely to have adverse impacts; normally, they have negligible or minimal direct disturbances on the physical setting. Professional judgment finds the project to have negligible, insignificant, or minimal environmental impacts. Beyond screening, no further EA action is required.

Category FI. A Category FI project involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

The Bank reviews the findings and recommendations of the EA to determine whether they provide an adequate basis for processing the project for Bank financing. When the borrower has completed or partially completed EA work prior to the Bank's involvement in a project, the Bank reviews the EA to ensure its consistency with this policy. The Bank may, if appropriate, require additional EA work, including public consultation and disclosure.

Screening criteria. The selection of the category should be based on professional judgment and information available at the time of project identification. If the project is modified or new information becomes available, Bank EA policy permits to reclassify a project. For example, a Category B project might become Category A if new information reveals that it may have diverse and significant environmental impacts when they were originally thought to be limited to one aspect of the environment. Conversely, a Category A project might be reclassified as B if a component with significant impacts is dropped or altered. The option to reclassify projects relieves some of the pressure to make the initial decision the correct and final one.

Projects in Category B often differ from A projects of the same type only in scale. In fact, large irrigation and drainage projects are usually Category A, however, small-scale projects of the same type may fall into Category B, the same relates to aquaculture projects and many others. Projects entailing rehabilitation, maintenance or upgrading rather than new construction will usually be in Category B. A project with any of these characteristics may have impacts, but they are less likely to be “significant”. However, each case must be judged on its own merits. Many rehabilitation, maintenance and upgrading projects as well as privatization projects may require attention to existing environmental problems at the site rather than potential new impacts. Therefore, an environmental audit may be more useful than an impact assessment in fulfilling the EA needs for such projects.

The selection of a screening category often depends also substantially on the project setting, while the “significance” of potential impacts is partly a function of the natural and socio-cultural surroundings. There are a number of locations which should cause to consider an “A” classification:

- in or near sensitive and valuable ecosystems - wetlands, natural areas, habitat of endangered species;

- in or near areas with archaeological and/or historical sites or existing cultural and social institutions;
- in densely populated areas, where resettlement may be required or potential pollution impacts and other disturbances may significantly affect communities;
- in regions subject to heavy development activities or where there are conflicts in natural resource allocation;
- along watercourses, in aquifer recharge areas or in reservoir catchments used for potable water supply; and
- on lands and in waters containing valuable natural resources (such as fish, minerals, medicinal plants; agricultural soils).

The World Bank's experience has shown that precise identification of the project's geographical setting at the screening stage greatly enhances the quality of the screening decision and helps focus the EA on the important environmental issues.

World Bank Public Consultation and Disclosure requirements. For all Category A and B projects proposed for WB financing, during the EA process, the borrower consults all involved parties, including project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and takes their views into account. The borrower initiates such consultations as early as possible. For Category A projects, the borrower consults these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized; and (b) once a draft EA report is prepared. In addition, the borrower consults with such groups throughout project implementation as necessary to address EA-related issues that affect them. For meaningful consultations between the borrower and project-affected groups and local NGOs, the borrower provides relevant material in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted. For a Category A project, the borrower provides for the initial consultation a summary of the proposed project's objectives, description, and potential impacts; for consultation after the draft EA report is prepared, the borrower provides a summary of the EA's conclusions. In addition, for a Category A project, the borrower makes the draft EA report available at a public place accessible to project-affected groups and local NGOs. Any Category B EIA report for a project proposed for WB financing is made available to project-affected groups and local NGOs. Public availability in the borrowing country and official receipt by the Bank of Category A reports for projects proposed for WB financing, and of any Category B EA report for projects proposed for WB funding, are prerequisites to Bank appraisal of these projects.

3. Baseline analysis (for Issyk-Kul oblast)

3.1 Project Geographical location and administrative structure

Issyk-Kul Province (Oblast) is one of the regions of Kyrgyzstan. Its capital is Karakol. It is surrounded by Almaty Region, Kazakhstan (north), Chuy Region (west), Naryn Region (south-west) and Xinjiang, China (south-east). It takes its name from Lake Issyk-Kul ("warm lake"), the second largest saline lake in the world, which never freezes despite its altitude in the Tian Shan mountains.Issyk–Kul. Oblast lies between 41°08' and 42°59' N latitude and 75°38' and 80°18' E longitude, and its basin is within the geographic area of the northern Tian Shan Mountains. The north is dominated by the eye-shaped Issyk-Kul lake, surrounded by the ridges of the Tian Shan mountain

system: the Kyungey Ala-Too mountains to the north and the Terskey Alatau to the south (the 'sunny' and 'shady' Alatau, respectively). To the south is mountains and 'jailoos' (mountain meadows used for summer grazing). The highest peaks of the Tian Shan mountains, including Khan Tengri, are located in the eastern most part of the province.

Total area of Issyk-kul Oblast is 43,100 km^2 . Issyk-Kul oblast is divided administratively into five districts: Ak-Suu District (Center - Karakol), Jeti-Oguz District (Center - Kyzyl-Suu), Tong District (Center – Bokonbaev); Tyup District (Center Tyup); Issyk Kul District (Center - Cholpon-Ata).

3.2 Description of the project area

Geology. The Kyrgyz Republic is mountainous, with a large portion situated in the Tian Shan folded area, whose geosyncline development was completed 200 million years ago. About 20–30 million years ago, relatively quiescent platform development was interrupted by intense tectonic movements, which still continue, determining the country's modern mountain relief. The Kyrgyz Republic is within a high seismic activity area. According to the last seismographic zoning map in 1996, more than 70% of the Issyk-Kul oblast is located within a 9-ball intensity on the MSK6 scale

Soil. According to geomorphologic conditions, the soil is divided into four groups: (i) soil from the foothills (half-reserved inter-mountainous hollows from 500 to 1,000 meters [m] of absolute height); (ii) soil from completely reserved inter-mountainous hollows (1,300–3,200 m); (iii) outside soil of the mountains (3,000–4,000 m); and (iv) soil from mountain slopes (1,000–5,000 m).

Within these groups, soils are distinguished separately. In the half-reserved inter-mountainous hollows (the foothills along the northern and eastern borders of Lake Issyk–Kul [1,600–1,900 m]), sandy gray-, gray-brown-, and chestnut colored soils and chernozemy are spread; naked and gray desert steppe and chestnut steppe soils are spread outside of the mountains.

In coastal areas, azonal and intrazonal soils have resulted from sedimentation and wetland conditions, while the settlement area around the lake is characterized mainly by lowland and foothill soils that are sandy grey with gravel intrusions, high permeability, low buffer capacity, and low organic content. Soils in landfill sites are highly permeable.

Climate. The area has a continental climate with relatively little rainfall. However, the significant relief difference and the presence of the large Lake Issyk-Kul vary the climate from sharp continental to close to marine. In Issyk-Kul oblast there is a considerable difference between the western end of the lake which only receives an average of 200 mm and the eastern end which can receives up to 600 mm a year. Rain and snow occur mainly in the autumn and winter but sometimes well into the spring, until late May or even early June. Summers are generally dry but storms of heavy rain, hail and even snow occur, even in mid-summer and even at lower altitudes. High mountains around the basin protect the area from cold Arctic air masses and hot Central Asian desert air. This special climate creates geographic diversity, ranging from deserts (in the west) to permafrost zones (in the peaks of the bordering mountains). The nonfreezing water mass of the lake also soothes the climate. At the lake, maximum summer temperatures do not exceed 30°–33° C, and the highest water temperatures in the coastal zone reach 22°–26° C. Frequent and strong Ulan and Santash windstorms from the west and east, respectively, aerate the basin.

Figure 1 indicates a yearly average temperature along the lake shore of 8 degree, resulting from the continental type of climate with short hot summer and very cold long winter.

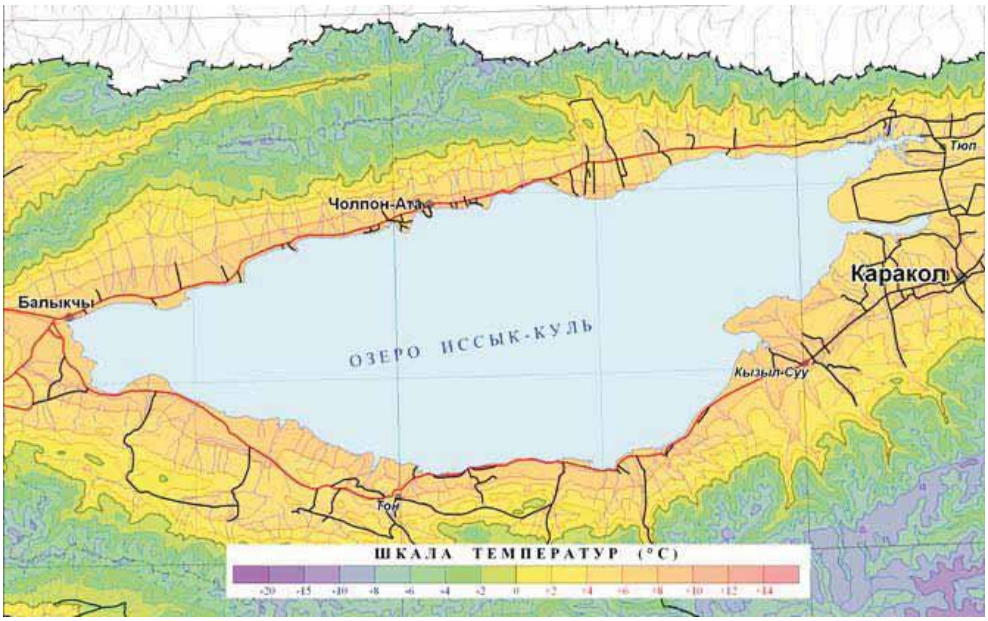

Figure 1. Temperature Zones at Issyk-Kul area

The average temperatures at the western part of the lake are slightly higher than at the eastern part with exception of Karakol, where the average temperature is comparable with that at the western part of the lake. The western part of Lake Issyk-Kul is a very dry desert type climate with average rainfall not over 100 mm. The eastern part of the north and east coast receive three to four times more rain, resulting as well in different type of soil (see Figure 2 below).

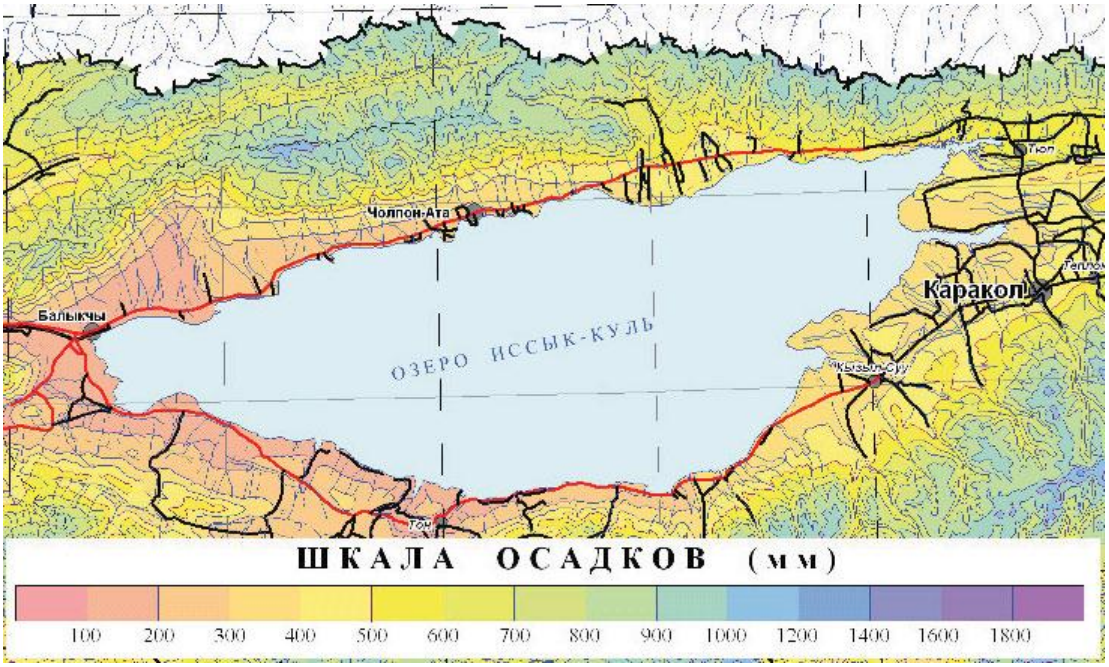

Figure 2. Zones of rainfall at Issyk Kul area

Hydrology. The oblast contains 3,297 glaciers—with an overall area of 4,304 square kilometers—sourcing local rivers with clean, fresh water.

Lake Issyk–Kul is located in north-eastern Kyrgyz Republic, Issyk-Kul oblast. A mountain range to the north and the Teskei-Alatau mountain range to the south. Its basin is one of the Kyrgyz Republic's most important natural areas, occupying 22,080 square kilometers, about one half of the oblast's entire area. The lake's average depth is 280 m, its maximum depth is 668 m, and its overall area is 6,236 km2. The overall water volume of the lake is 1,738 km^3. Issyk-Kul is a closed lake; hence its waters are partly saline. The salinity with 5.968 g/L is not high and is five-and-a-half times lower than that of oceans. Its mineral content is chloride/sulfate/sodium/magnesium-based. The waters of Issyk-Kul are rich in oxygen, as a result of aeration and movement of lake waters.

The Issyk–Kul river network is throughout the entire lake's depression and has more than 180 streams. Within the basin 118 rivers and streams flow towards the lake, but only 49 of them actually drain into it. The largest of them are the Jerlagan and Tiup rivers, which begin in eastern part of the basin. The quality of the river water in the area of consumption is worse than in the area of its formation due to anthropogenic load and regulated water flows. Most of the rivers are used for irrigation, and their water fails to reach the lake. Therefore, bays in the northern and western coasts suffer from increased mineralization.

Forests and Pastures. In the Kyrgyz Republic, approximately 90% of forest areas are located at an altitude of 700 to 2,500 m above sea level. As per data for 2014, the forest area of Kyrgyzstan is 1,135.5 thousand hectares or 5,7% of the total country area[10]. Forest area of Issyk-Kul area is 0,71% of the total area of country or 144 thousand ha. The forest are mainly populated by four species: walnut, pine-fir, juniper and floodplain species.

Pasture area in the Issyk-Kul region in beginning of 2015 was 1 405,7 thousand hectares. The management load on pastures/rangelands is one of the most important elements of their sustainable use, and allows for higher productivity in the long term. When compared with 2010, the total livestock population has increased from 97,1 thousand heads to 2112,1 thousand head or 48%. The livestock load per hectare of pasture is 1,5 conventional stock units[11].

Protected areas. The Ramsar Convention was signed by the former Soviet Union in the 1970s. In 1976, the Issyk–Kul Nature Reserve was designated as a wetland of international importance. In March 2003, this designation was reinstated after ratification by Parliament on 10 April 2002. In September 2001, the Issyk–Kul Biosphere Reserve was included in the World Network of Biosphere Reserves by UNESCO[12]. The Issyk–Kul Biosphere Reserve coincides with the borders of Issyk–Kul Oblast. A government directive from January 2000 regulates the activity of the Issyk– Kul Biosphere Reserve Directorate (BRD).

To organize and maintain sustainable development in the biosphere reserve, zones have been designated with separate preservations and use. Goals for protection and development differ from zone to zone, as do standards for use. The most important part of the Issyk-Kul biosphere reserve is the core area with reserve status, this consists of Issyk-Kul and the Sarychat state closed wood and Game Park and other especially natural areas. With the help of GTZ and in consultation with related government and non-governmental participants, the Issyk-Kul Biosphere Reserve, in accordance with UNESCO requirements, was divided into core, buffer, transition and rehabilitation zones. The zoning has major implications on future development of the region – see Figure 3 below.

[10] "National forest inventory of the Kyrgyz Republic" (Government of the Kyrgyz Republic, 26th July 2011, No.407) and Environment in Kyrgyz Republic, 2014 – Statistical collection, NSA

[11] Source: NSC. On 1st January 2012, livestock was converted into following conventional units: 1 cow is equal to 5 heads of sheep, 1 horse is equal to 6 heads of sheep.

[12] The National Report on the state of the environment of the Kyrgyz Republic for 2006-2011 (Bishkek, 2012)

Figure 3. Issyk-Kul Biosphere Reserve and its Zoning

There are following specially protected areas within the Issyk-kul Biosphere Reserve: 2 nature preserves (Issyk-Kul National Preserve – 19,661.5 ha, Sarychat-Ertash National Preserve – 129,760); 1 Karakol Nature National Park (38,256 ha); 10 nature reserves, of which 5 are zoological (Tuyup, Jeti-Oguz, Chonzhargylchak, Kensuu, Aksuu - 114,336 ha), 2 are botanical (120 ha), 1 forest (95 ha) and 2 geological reserves[13].

Environmental pollution. The main sources of atmospheric air pollution in Kyrgyzstan are the enterprises of the energy industry, mining and processing sectors of industry, construction materials, utilities and the private sector, as well as mobile sources of pollution, such as transport[14]. Atmospheric emissions from stationary sources in Issyk-Kul region in 2014 were about 2.7 thousand tons (NSC data). In 2014 there were 6.3 kg of pollutants per resident in Issyk-Kul oblast, which is less in comparison with Chui region, Bishkek and Osh.

Issyk-Kul Region makes one of the lowest contribution to the total amount of greenhouse gases emissions – only 5.3% of a total amount in the country. Among main sources of greenhouse gas emissions agriculture makes up to 16.1% of a total volume.

In 2014, 97% of all hazardous waste were created in Issyk-Kul region mainly from Kumtor gold-mining. There are about 400 ha for hazardous wastes disposal and also radioactive tailings dumps in the oblast.

Flora and fauna and endangered species. The Kyrgyz Republic has ratified the United Nations Convention on Biological Diversity, and about 10 laws have been passed since independence to support biodiversity conservation. The country is at the center of the Central Asian biodiversity "hotspot", with a high density of endemic species representing Himalayan flora and fauna biotypes. There are more terrestrial species than endemic fish species. Thirty-nine of these are on the endangered list. Over 30 species are found mainly on the foothills and mountain slopes. The Issyk-Kul lake never freezes; thus, it plays a special role in biodiversity preservation. About 50,000–80,000

[13] The National Report on the state of the environment of the Kyrgyz Republic for 2006-2011 (Bishkek, 2012)
[14] The National Report on the state of the environment of the Kyrgyz Republic for 2006-2011 (Bishkek, 2012)

birds from 30–35 species winter at the lake. The lake is important for many other bird species as well, who use it as a stopover and feeding ground during seasonal migration.

Wildlife. Issyk–Kul Oblast has interesting fauna, with numerous endangered species finding refuge in its many unpopulated areas. The lake's western and eastern shores serve as a wintering place for waterfowl. Currently, the number of waterfowl and near water-living birds is around 67,000 from 29 different species, among them greylag geese (*Anser anser*) and mute swans (*Cygnus olor*), which winter at Lake Issyk–Kul. The shores and protected preserves provide habitat to a great variety of ducks, including the bald coot (*Fulica atra*), pochard (*Aythya ferina*), and tufted duck (*Aythya fuligula*). The great-crested grebe (*Podiceps cristatus*), grey heron (*Ardea cinerea*), little grebe (*Tachybaptus ruficollis*), and red-necked grebe (*Podiceps grisegena*) nest and winter at the lake, with over 200 bird nests a season. Among the numerous species of birds, particularly noteworthy are the bar-headed goose (*Anser indicus*) and rare ibisbill (*Ibidorhyncha struthersii*).

The mammals' world is very rich, consisting of six orders and 34 species (including insectivores, chiropters, rodents, carnivore, lagomorphs and artiodactyls) such as: (i) Insectivores. Long-eared hedgehog, pygmy shrew, and water shrew; (ii) Chiropters. Bearded tit, common noctule, common pipistrelle, and long-eared bat; (iii) Rodents and gnawing mammals. Common vole, dwarf hamster, field mouse, house mouse, Libyan jird, Siberian jerboa, tamarisk Gerbil, Tian Shan redbacked vole, Tian Shan souslik, and tolai hare; (iv) Carnivores. Common weasel, fox, jackal, raccoon dog, steppe polecat, and wolf; and (v) Artiodactyls. Roe deer and wild boar.

Most of these animals, despite civilization adapted animals, waterfowl, and near-water living habitat fowls, are pushed back from the shore area and are not observed in settlement areas

*Aquatic Fauna and Fishery***.** Issyk–Kul is home to a diverse group of endemic species that are also highly valued commercial fish. It also has many introduced species and hosts several high-mountain Asian fish species, eight of which are endemic. The following fish species are present in Lake Issyk–Kul: amur chebachok (*Pseduorasbora parva*), bream, giebel carp (*Carassius gibelio*), omul (*Coregonus migratorius*), pike-perch, rainbow trout (*Salmo gairdneri*), sevan trout, sleeper (*Hypseleotris cinctus*), striped gudgeon (*Alburnoides taeniatus*), tench, and whitefish (*Coregonus lavaretus*).

According to a National Academy of Sciences, the lake's fish stock is in critical condition.

3.3 Social and economic situation

Population: The resident population of the Issyk-Kul oblast was recorded as 463,900 people (assessment for 1st January 2015, NSC data) including 130,800 urban and 333,100 rural population. Density of population here is 11/km^2. More than 2/3 of total population resides in rural areas. Highest densities are in the major cities Balykchy, Cholpon-Ata and Karakol. Moreover, the area around Cholpon-Ata can clearly be seen as the largest and most dense populated area due to the development of this area for tourism. The area's average unemployment level is 8%, and it suffers from the highest Gini index in the nationwide rich–poor ratio. There are six colleges and lyceums, with some 2,580 students and 295 teachers. Higher education consists of six universities, with the largest in Karakol. Humanitarian education prevails over technical education. About 95% of the population are ethnic Kyrgyz with ethnic Russians constituting the major part of the remaining 5%.

Transportation. The railroad coming from the northwest (from Bishkek) ends at Balykchy. The main highway (A365) from Bishkek passes through Balykchy and into Naryn Province on its way to the Torugart Pass into China. Highway A363 circles the lake and A362 runs east from the lake into Kazakhstan. Issyk-Kul International Airport and Karakol International Airport link the Province with Almaty in Kazakhstan. Cholpon-Ata Airport and Tamga Airport have no regular flights.

Economic Development. The inner regional product growth in 2005 was driven by industry, and in 2006 and 2007 by agriculture. The nominal per capita inner regional product growth during 2005–2007 was 49.3%. The mining industry is represented by the world's largest gold mine at Kumtor; however, most of its benefits are allocated to the central budget.

Land Use. The Issyk-Kul region occupies 4,134.4 thousand hectares (21% of country area), the area of agricultural land is 1,602.600 ha (17%), of which 191,000 ha is arable land, 12% of the agricultural land area. Compared to 2009, the cultivated area increased by 306 ha in 2012 due to development of low productivity pastures (only for registered land parcels). The number of land owners and users in the Issyk-Kul region is about 365000. The average land user in the Issyk-Kul region has about 11,3 ha of agricultural land.

Tourism. Tourism is represented by private hotels and resorts. The average annual number of tourists varies from 700,000 to 1,000,000. Recreational and spa tourism and tourism for children and sports are weakly represented. In total, there were over 207 tourist entities registered by 2008. The share of international tourists has increased to 80%, and they are primarily from Kazakhstan, Russia, and Uzbekistan.

3.4 Agriculture and cattle sector

The oblast produces 12% of total national cereal crops and over 40% of potato crops. Of the total area of orchards nationwide, 20% are in Issyk–Kul.

Issyk-Kul is a major livestock area in Kyrgyzstan. Dairy product processing covers 50% of the national dairy product supply. Many milk-processing companies are located in the Issyk-kul region because the raw milk is relatively cheaper there. Issyk-kul raw milk producers do not have access to the Kazakhstan market where they can sell their raw milk at higher prices. That is why they sell to local milk-processing companies.

There is a high prevalence of food insecurity and the level of remittances is very low with only 5% of household in Issyk-Kul recording income from remittances. Due to relatively high altitudes and thus rough climate conditions, the opportunities to grow arable crops in the oblast is limited. Thus the rural populations rely predominantly on livestock for their livelihoods. While average cattle herd size is typical of the national average (2 head), sheep and goat flock sizes are significantly greater than average –13 head of cattle and 54 head of sheep and goats per 100 ha of agricultural lands in Issyk-Kul oblast, respectively, compared to around nine head nationally[15].

Animal breeding is growing, with average annual sheep and cattle surplus at 5%–6%. Grazing land is overloaded by 1.5 times its capacity. Thus, shrinkage of grazing land and agricultural land transformation have led to social conflicts (e.g., grazing on beaches, resort areas, and arable land).

Since 1995 livestock numbers have been increasing, particularly in recent years. From 2003 to2009 the numbers of cattle, horses, sheep and goats in Kyrgyzstan increased by 27%, 10% and 31% respectively, with the resultant increases in pressure on pasture reserves. As a result, there is an imbalance in pasture utilization, with under-grazing of distant summer pastures and overgrazing of village/near-by pastures. This situation, together with insufficient quality feed in winter and early spring, has resulted in low livestock productivity. Data shows productivity per capita is stagnant, raising concern of livestock management. The factors affecting animal productivity, which is low, are: poor nutrition, disease, parasites, and poor animal and farm management. By correcting these nutritional, disease and management constraints the livestock sector output has the potential to be increased considerably. This is important to both rural nutrition and income levels.

[15] Agriculture of Kyrgyz Republic, 2010-2014 – Statistical Collection, NSA

The seed rate for wheat in the Kyrgyz Republic is about 230 kg/ha (up to 300 kg/ha in Issyk-Kul oblast) and 200 kg/ha for barley. According to FAO, these rates are high and reflect farmers substituting seed use for other factors, for example, inadequate soil preparation and planting, reduced use of fertilizers, and harsh winters that result in low seed germination.

Use of organic fertilizers (manure) in Issyk-Kul oblast has increased since 2006 from 34.4 thousand tons to 104 thousand tons in 2014[16].

4. Analysis of Potential Environmental Impacts[17]

The proposed project activities and in particular those under the Veterinary Services and Animal Health and Diary Value Chain Investments components (upgrading/construction of veterinary analytical laboratory and installing of new veterinary points; improving the animal heard; purchasing of inputs and machinery for feed and fodder production; animal shelter improvement; silage production; agro-processing and milk collection and cooling equipment; etc.) might generate a series of various environmental and social impacts. These impacts would be associated with the following: (a) increased pollution with wastes, noise, dust, and air pollution, health hazards and labor safety issues, etc., due to civil works; (b) increased ground and surface waters pollution due to use of agro-chemicals and silage production; (c) threats to human health and wildlife due to improper handling of treated seeds, fertilizers and pesticides, and due to inappropriate management and disposal of livestock vaccines and other drugs. All of them are expected to be typical for small scale construction/rehabilitation works or for various agricultural and dairy processing activities, temporary by nature and site specific and can be easily mitigated by applying best construction and/or agro-processing practices and relevant mitigation measures.

The project will generate also a great number of both direct and indirect positive impacts. Direct positive impacts will be generated by increased dairy production, which would result in creation of new jobs and respectively, and increased income. There will be generated also a series of beneficial environmental impacts associated with the reduced pressure on the pastures, improving veterinary waste management, better agro-chemicals usage, better silage production, improved farmer skills from training in technologies, seed breeding, etc. Indirect positive impacts will relate also to overall improving of business environment in rural areas, introduction of advanced dairy technologies and techniques, contribution to poverty reduction and food safety.

The text below provides more details on potential project impacts of the project.

4.1 Impacts associated with the upgrading veterinary analytical laboratory and other small scale construction and rehabilitation activities

During construction and/or rehabilitation activities of laboratory, construction or rehabilitation of premises for veterinary posts or of vaccine storage facilities or other small scale construction/rehabilitation of various premises for agro-processing and milk collection and cooling equipment, construction of animal shelters, the main negative impacts relate to soil and water pollution through waste generation, air pollution, acoustic and aesthetics, as well as labor safety

[16] See: Environment in Kyrgyz Republic, 2014 – Statistical collection, National Statistical Agency (NSA)
[17] See: Environmental, Health, and Safety Guidelines **(**MAMMALIAN LIVESTOCK PRODUCTION) http://www.ifc.org/wps/wcm/connect/e2cfd90048855333ae04fe6a6515bb18/Final%2B-%2BMammalian%2BLivestock%2BProduction.pdf?MOD=AJPERES

issues. The most common potential negative impacts from these activities and their significance can be summarized as follows:

a) *Dust, air pollution and noise.* These are the most common environmental effects during the civil works which depends on the scale of construction activities and types of facilities to be constructed or renovated.

b) *Waste handling and spill response*: (re)construction activities will also generate solid and liquid wastes including drywall, machine oil, paints, and solvents. Minor spills of fuel and other materials are likely to occur during the course of rehabilitation activities. Improper handling of on-site wastes and response to spills could result in adverse effects on the local environment including groundwater and students.

c) *Asbestos*: at this stage it is not known if asbestos has been used in premises to be proposed for rehabilitation of the veterinary laboratory, but taking into account its large usage in the past it is possible to find such material used as an insulation material and/or roofing material. In the case of inappropriate handling of asbestos this material might be a real health concern for the construction workers, and the general public in the vicinity of the rehabilitated premises in particular when it is inhaled.

d) *Labor and safety impacts*: during civil works in the case the workers do not obey necessary safety rules, they might be subject to various accidents.

e) *Health impacts* associated with indoor construction activities in the case of the usage of noxious/toxic solvents and glues and of lead-based paints.

f) *Waste waters* as the results of inadequate implementation of sanitation activities.

g) *Pollutant air emissions from the associated boilers*. The types of pollutants and their volumes also depend on the type of boilers and of used fuels.

4.2 Livestock impacts and including on pastures

Following potential livestock impacts can be expected from project activities:

- Environmental impacts of potential expansion of livestock, including the management of cattle manure and increased pressure on grazing lands;
- Potential risks of degradation or changing species composition in the pastures due to overgrazing as well as soil losses because of erosion, and a reduction in soil productivity caused by alteration of the vegetation status and composition.
- Environmental pollution during animals feeding. Livestock feed includes hay, grain (sometimes supplemented with protein, amino acids, enzymes, vitamins, mineral supplements, hormones, heavy metals, and antibiotics), and silage. Feed can become unusable waste material if spilled during storage, loading, and unloading or during animal feeding. Waste feed, including additives, may contribute to the contamination of storm-water runoff, primarily because of its organic matter content[18].

Manure management. Mammalian livestock production operations generate significant quantities of animal waste, mainly in the form of un-metabolized nutrients excreted as manure.

[18] WB Environmental, Health, and Safety Guidelines for Mammalian Livestock Production (http://www.ifc.org/wps/wcm/connect/e2cfd90048855333ae04fe6a6515bb18/Final%2B-%2BMammalian%2BLivestock%2BProduction.pdf?MOD=AJPERES

Manure contains nitrogen, phosphorus, and other excreted substances which may result in air emissions of ammonia and other gases and may pose a potential risk of contamination to surface or groundwater resources through leaching and runoff. Manure also contains disease-causing agents such as bacteria, pathogens, viruses, parasites, and prions, which may also potentially affect soil, water, and plant resources (for human, livestock, or wildlife consumption). Most of the animal waste is generated at housing, feeding, and watering locations. Following are the summary of positive and negative potential impacts for manure application here:

Positive environmental impact

- Soil fertilization by manure application: decomposition of the organic material by microorganisms produces carbon dioxide (CO_2), water and minerals of plant nutrients as N, P, S and metals. The mineralization is the transformation of organically bound elements into plant available nutrients. Application of manure to crop land or pastures will reduce the requirements of artificial fertilizer.
- Soil fertility improvement: organic matter that remains one year after application is assumed to be part of the soil organic matter and will decompose gradually over the years, releasing plant nutrients.
- Improvement of the soil structure stability. Organic matter is also involved in the physical properties of soil e.g. porosity, aeration water holding capacity, it improved soil structure and reduces the soil vulnerability to erosion.
- Improvement of inorganic fertilizer potentiality: organic matter in soil increases the capacity of absorption of minerals, reducing the loss of the elements brought in the fertilizers. Absorbed elements are gradually released for plant nutrition.

Negative environmental impacts:

- Runoff of manure and manure components into surface water, contributing to water pollution.
- Leaching of nitrate and phosphorus into the ground water, contributing to underground water pollution.
- Ammonia emissions: before and during storage, and during application in the field.
- Emission of NOx: this is formed as a by-product of the denitrification process.
- Emission of methane, formed upon decomposition of manure under anaerobic conditions.
- Air pollution. Dairy cows and their manure produce greenhouse gas emissions which contribute to climate change.

Overall it is expected the project will not contribute to expansion of the livestock – it would make its contribution to reduction of number of head directed on improving of heard quality and the project focus is replacing of more numerous herds with less but more productive animals.

From other hand, improvement of fodder production will lead to increasing of farmers' abilities to feed the animals at home and less using pastures what can also contribute to reduction of pastures degradation.

4.3 Dairy agro-processing impacts

Sub-projects related to dairy agro-processing to be implemented under the project activities will generate a great number of both direct and indirect positive impacts.

Direct positive impacts will be generated by increased agro-processing activities which would result in creation of new jobs and respectively, more employment and increased income. Indirect positive impacts will relate to overall improving of agricultural production and business environment, introduction of advanced agricultural technologies and techniques & quality standards at enterprises. In addition, use of advanced machinery & equipment, providing additional value to produced agricultural production enhancement competitiveness of domestic production and products, will contribute to poverty reduction and food safety, improvement of country's socio-economic conditions in urban and rural areas and others.

Despite their important contribution to overall and agricultural development, agro-processing industries can also give rise to undesirable environmental side-effects. Left unchecked, like any other industry, agro-industry can create environmental pollution or hazards in various ways: the discharge of organic or hazardous wastes into water supplies; the emission of dust or gases that affect air quality and produce toxic substances; and the use of dangerous machinery that can put the safety and health of workers at risk.

In dairy agro-processing sector - production/agro-processing production of cheese, yogurts; butter; other dairy products, the main impacts are related to surface water pollution through increased concentrations of pollutants in wastewater effluents and their treatment, waste management, emissions to air, mostly dust and odor, acoustic, vibration, water and energy consumption, labor hazards.

The overall potential adverse impact can be from high to moderate, primarily due to human health threat.

Following are the main potential adverse impacts of dairy agro-processing:

- Contribution to surface water pollution/wastewater from silk solids (e.g. protein, fat, carbohydrates, and lactose), salting activities during cheese. It can lead to significant organic content, high salinity levels; creation of other pollutants as acids, alkali, and detergents, etc. as well as pathogenic microorganisms and viruses;
- Soil, groundwater and surface waters can be polluted, and solid waste amount can be increased due to production processes, nonconforming products and product losses, grid and filter residues, sludge from centrifugal separators and wastewater treatment, and packaging waste;
- Air pollution and air emissions as well as dust level can be caused by dairy processing activities and lead to fine milk powder residues in the exhaust air from the spray drying systems and bagging of product;
- Dairy processing facilities are related to on-site wastewater treatment facilities, in addition to fugitive odor emissions from filling/emptying milk tankers and storage silos what can increase the odor level in area.
- Dairy processing facilities consume considerable amounts of energy and can strengthen stress on natural resources.

The risks of pollution are relatively smaller at the initial stages of preservation and transformation, but they may increase with the level of physical and chemical alteration, particularly in the industries using dated equipment and technology (new technologies are less polluting than old ones in terms of wastes and emissions per unit of output).

The size of the industry may be an important factor, but not determinant in itself. The smaller-scale industries can also generate scattered pollutants with a cumulative effect in a given geographic region. This is especially so since small industries, particularly in low-income countries, lack the financial resources to use modern and clean technologies. Anti-pollution regulation can be an important contributor, not only to reducing the release of polluting residues, but also to using them in profitable ways.

In general terms, waste products may occur as waste water, solid material, volatile compounds or gasses that are discharged into the air.

Wastewater. An important environmental impact of the animal processing industry results from the discharge of wastewater. The dairy processing require the use of water. This water and water used for general cleaning purposes will produce wastewater. The strength and composition of pollutants in the wastewater evidently depend on the nature of the processes involved. Discharge of wastewater to surface waters affects the water quality in three ways:

- The discharge of biodegradable organic compounds (BOC's) may cause a strong reduction of the amount of dissolved oxygen, which in turn may lead to reduced levels of activity or even death of aquatic life.
- Macro-nutrients (N, P) may cause eutrophication of the receiving water bodies. Excessive algae growth and subsequent dying off and mineralization of these algae, may lead to the death of aquatic life because of oxygen depletion.
- Agro-industrial effluents may contain compounds that are directly toxic to aquatic life.

Suspended Solids (SS). Suspended solids are insoluble organic and inorganic particles present in wastewater. SS is mainly material that is too small to be collected as solid waste. It does not settle in a clarifier either. Discharge of SS increases the turbidity of water and causes a long term demand for oxygen because of the slow hydrolysis rate of the organic fraction of the material. This organic material may consist of fat, proteins and carbohydrates. The natural biodegradation of proteins (from for instance milk), will eventually lead to the discharge of ammonium. Ammonium oxidation into nitrite and nitrate by nitrifying bacteria, leads to an extra consumption of oxygen.

Eutrophication. Nitrogen (N). In wastewater Nitrogen is usually present as fixed in organic material or as ammonium. Occasionally also nitrate may be present (this may be the case in dairy industries where HNO_3 is used for cleaning operations). Nitrogen and phosphorus (P) removal can be achieved through special wastewater purification systems, which are based on either biological or physic-chemical processes.

Solid waste. By-products that are not used in any way will be referred to as solid waste. They must be dumped. The following types of solid waste may be distinguished: (a) toxic compounds. These compounds require special attention, e.g. special dumping grounds; (b) organic compounds. These compounds may require attention under certain conditions because of hygienic reasons or because during decomposition ill odor or leaching problems may arise; and (c) non degradable compounds. These may be dumped at regular dumping grounds.

Air pollution. An important factor with respect to environmental impact is whether the produced milk is processed at home or in a factory. Home processed milk hardly offers any environmental problems as little waste is produced (mainly air pollution from heating and some

pollution of cleaning water with milk residuals) and as the concentration of the waste is generally low.

4.4 Impacts of investments in improving the animal heard

The proposed investments in improving the animal heard might generate a series of various environmental and social impacts, positive and negative. Positive impacts attribute mainly to socio-economic environment. Negative impacts attribute to water, air and soil pollution, odor, health risks, loss of biodiversity and habitats, etc.

Potential social impacts. The sub-projects to be implemented under the on mentioned investments will generate a great number of both direct and indirect positive impacts. Direct positive impacts will be generated by increased production in milk production due to animal heard improvement, which would result in creation of new jobs and respectively, and increased income. Indirect positive impacts will relate to overall improving of business environment, contribution to poverty reduction and food safety.

Potential adverse environmental impacts can include following:

- Solid waste generated during mammalian livestock production (waste feed, animal waste, and carcasses, as well as various kinds of packaging (e.g. for feed and pesticides), used ventilation filters, unused / spoilt medications, used cleaning materials, and sludge from wastewater treatment if present (which may contain residual amounts of growth enhancers and antibiotics, among other hazardous constituents);
- Odor and air emissions;
- Waste water;
- Hazardous materials used throughout the beef, and milk production cycles (e.g. disinfecting agents, antibiotic and hormonal products;
- Animal diseases.

Positive impacts. It is expected that Project will have beneficial impacts in these areas as there will be less animals and more productive ones. Also it means fewer animals required for the same production volume and less pressure on pastures; improved quality of production and respective products for markets, including foreign ones; increased farm incomes; improved rural economic situation, etc.

4.5 Impacts of chemicals

Cattle feeding varies according to the type of production and the climatic region in which the production is located. Dairy cow feed is based on roughage, such as corn or grass silage, hay, fresh grass, and grazing.

Among potential here are impacts of use of mineral fertilizers and pesticides for improving fodder production. The overall potential impact can be from moderate to high.

Mineral nutrient fertilizers imported from Russia, Uzbekistan and Kazakhstan and used in Kyrgyzstan so far include nitrogen (ammonium nitrate, urea), phosphorus (ammophos, superphosphate and superphosphate) and potassium. Applying pesticides in country include herbicides, fungicides and seeds disinfectants.

In order to produce sufficient quantity of feed and forage for winter supplementation, smallholder farmers need to cultivate increased quantities of barley (*Hordeum vulgare*), lucerne (*Medicago sativa spp*.) and sainfoin (*Onobrychis viciifolia*).

Improper use of mineral fertilizers can lead to soil degradation/ reduction in soil organic content and less reliance on compost material and manure for meeting soil fertility requirements, modified soil structure and reduction in soil moisture holding capacity; increase in soil acidity. In the long run, possible loss of productivity as a result of insufficient soil moisture; loss of soil's natural fertility. Chemical fertilizers can contribute to increasing of emissions of greenhouse gases and therefore to global warming resulting in climate change. Fertilizer runoff may cause nutrient enrichment of water bodies and eutrophication of water bodies, modification of aquatic ecosystems.

Other impacts can be expected from use of insecticide/acaricide livestock dips applied directly to livestock or to structures (e.g. barns and housing units) and to control pests (e.g. parasites and vectors) using dipping vats, sprayers, and foggers. Pesticides can also be used to control predators. The potential pollutants from pesticides include the active and inert ingredients, diluents, and persistent degradation products. Pesticides and their degradation products may enter groundwater and surface water in solution, in emulsion, or bound to soil particles. Pesticides may, in some instances, impair the uses of surface waters and groundwater. Some pesticides are suspected or known to cause chronic or acute health hazards for humans as well as adverse ecological impacts.

Acaricides are the major chemicals used to control ticks and other ectoparasites. As the ticks take animal blood meal, they also transmit disease causing organisms to not only the livestock but also man they present a strong constraint to livestock production in the project area. To reduce their impacts the farmers routinely use the conventional control methods which include the use of chemical Acaricides and give some partial results albeit shortcomings like the presence of chemical residues in milk, meat and the development of tick resistant strains. A wide range of Acaricides exist for use against ticks of domestic animals and livestock among one of the many methods used to control ticks. Documented in the project area Acaricides include arsenics, chlorinated hydrocarbons, organophosphates, carbamates and synthetic pyrethroids which are sold under the following names: Ivermektin, Inter-Ivermetin, Ivertet, Flyblock, Ecomektin, Cypek, Santomektin, Diazinon "Lucy", Solfisan, Ivermek Gold, Vilmektin, Rolenol, Ivermekvet. They are applied through, dipping, spraying, spot treatment or hand dressing.

Usually farmers do not wore any protective clothing during the administration of acaricides. Dermal exposure to these pesticides are usually overlooked or underestimated by farmers in KgR although the pesticides are capable of binding to the skin, extracting lipids out of the skin or rendering it permeable to other similar toxic chemicals. Pesticides residues in meat and milk are likely to be higher in livestock products produced by smallholder rural farmers. Inappropriate trading, labeling and use of acaricides and anti-helminthes in the project area raises concerns about food safety and public health. Because of their large use, these chemicals pose health risks to non-target species, including people, domestic and companion animals, wildlife, and aquatic species.

4.6 Impacts of the animal diseases

Animal diseases can enter a facility with new animals, on equipment, and on or people. Some diseases can weaken or kill large numbers of animals at an infected facility. From this point of view the project impacts will be positive as the project will support a series of activities for diseases control, through better veterinary services, vaccinations, veterinary points.

The main areas of environmental risk from project activities are (i) the inadvertent spread of the viruses during culling, transport and disposal of carcasses, animal waste, litter, and used protective gear; (ii) contamination of surface and groundwater from use of disinfectants; and (iii) laboratory bio-safety and waste management. In addition, minor environmental disturbances may occur during renovation of laboratories and vaccine storage facilities.

4.7 *Impacts of hey collection and of silage production*

Silage-production is a fermentation process aimed at preserving forage in its wet state away from air. One is seeking to lose minimum dry matter and nutritional value and to avoid creating products toxic to the animal. Harvesting forage for storage is only possible in meadowlands sufficiently well-maintained for this purpose or by growing intensive annual forage crops. It presupposes land prepared specifically for this use, even if it alternates with grazing. Cutting helps maintain permanent meadowland. On the other hand, intensive cropping poses the same environmental problems as agriculture.

Positive environmental impact of hey collection

- Grass-cutting generally promotes the maintenance of permanent meadows based on grasses (elimination of refuse and some weeds). It improves the composition of meadow flora.
- Cutting grass reduces the possible risk of fire. It can be practiced on fire-breaks.

Negative environmental impact of hey collection

- Repeated cutting can make the meadow flora uniform and lead to reduction of botanic diversity. Removal of forage harvests entails a transfer of nutrients and decreases soil fertility if there is no compensation by the use of fertilizers.
- Intensive annual forage crops have the same environmental impacts as other intensive crops: risk of erosion, reduced retention of organic matter in the soil, leaching of fertilizing elements leading to water pollution.
- Cutting annual meadows promotes seasonal stripping of the soil and can promote wind erosion.

Silage leachate is an issue for all farmers who have silage. Silage leachate can come from all forms of silage storage: bunkers, upright silos, bags, and piles. Handling leachate can be simple or complex depending on the scope of operation.

Silage leachate is an organic liquid that is formed when water, or in some cases pressure from the structure, comes in contact with silage and runs off. Leachate can be formed as a part of silage storage, especially if the corn or alfalfa is harvested too wet. Water comes in contact with the silage because it is part of the silage. The other source of leachate is rain water coming in contact with silage and carrying nutrients with it. This leachate has a high biological oxygen demand, BOD. If silage leachate is allowed to reach surface water, oxygen in the water will be consumed so quickly that anything living in the water, including fish, could immediately be in peril. Leachate also can cause algal blooms that will further deplete the oxygen levels of surface water and it can also produce high levels of ammonia which will also cause fish kill.

Groundwater is not immune to the hazards of silage leachate. Leachate can increase water's acidity due to its high nitrate-nitrogen levels. Another side effect of silage leachate in groundwater is a distasteful odor.

4.8 *Impacts as the results of laboratory bio-safety and waste management*

Project activities directed to increasing of laboratory bio-safety and proper waste management expected to have a positive environmental impact as the Project's investments in facilities, equipment, and training for veterinary services and laboratory will improve the effectiveness and safety of animal diseases handling and testing procedures.

Veterinary laboratories provide services to protect the health and well-being of local, national, regional, and global animal populations and associated commerce. Veterinary laboratories handle biological materials that can pose bio-risks to both animal and human populations. Poor management of wastes, including contaminated ones exposes health care workers, waste handlers and the environment to the risk of infections, toxic effects and contamination.

The principal routes for release of biological materials from laboratory environments, with subsequent potential exposures, include: i) personnel via surface contamination or infection, ii) intentional acts allowing release, iii) air-borne, iv) effluents, v) equipment and materials, such as fomites, vi) solid waste including carcasses, specimens and reagents, vii) release via live animals or vectors.

Risks caused by laboratory processes and procedures can be low, moderate or high. Nature of the procedures involving biological materials to be conducted in the facility can result in novel modes of spread and infection, activity characteristics include:

- Scale of work (e.g. small, large);
- Amplification;
- Volume and titer;
- Storage state of material: liquid, frozen, solid;
- Agents satisfactorily contained during laboratory processes;
- Generation of aerosols;
- Possibilities for cross contamination.

It is therefore of critical importance that laboratory managers ensure that bio-risks in their facilities are clearly identified, understood, controlled, and communicated to the appropriate stakeholders. For veterinary laboratories, bio-risk analyses focus on the potential for animal, human, and environmental exposures, including intentional and unintentional release of biological materials from the laboratory.

4.9 Involuntary resettlement issues

The project will not finance any activities that might trigger involuntary resettlement issues. Any infrastructure constructed under the project will be: (a) located on land already owned by participants, or will be bought or leased on a willing buyer-willing seller basis, and, (b) will be screened to ensure that it is free of legal encumbrance, or informal use or occupation by others who lack formal title. Hence the project will not support projects on land that is acquired involuntarily or triggers the policy in any other way.

All potential project impacts are summarized in the *Table 2* below.

Table 2. Environmental and social impacts and proposed mitigation measures

Proposed activities	***Expected environmental and social impacts (positive and adverse)***	***Measures to prevent/mitigate negative impacts***
1	**2**	**3**
Component 1. ***Fodder and Feed Development Program***		
Purchasing seeds, other inputs, equipment	*Positive*. Better seed breeding, reduction pressure on pastures; increased agricultural production; increased rural income; improvement of rural economy; contribution to country's food security, etc. *Adverse*. Threats to human health and wildlife due to improper handling of treated seeds, fertilizers and pesticides; risk for introduction of genetically modified plant seeds: transfer of introduced genes to other species (possibly weedy or invasive), unanticipated impact on beneficial insects, or increased pest resistance. Another concern related to the introduction or export of plants and plant products is the potential for introduction of pests. Consequences can be genetic drift into other areas where GMOs are not wanted.	- Use certified crop seeds that do not contain seeds from invasive alien species; -The introduction of GMO crops should be assessed for compliance with the existing host country regulatory framework for such introductions; - Proper storage of seeds
Demonstration farms/household high quality fodder production, hay preparation, feeding practices	*Positive*. Reduced pressure on pastures, introduction of advances agricultural techniques, increased mammalian livestock production; creating new jobs, contribution to ensuring of food security, contribution to poverty reduction in rural area and generally, to improvement of socio-economic conditions in rural areas, etc. *Adverse*. increased ground and surface waters pollution due to improper use of agro-chemicals	- Introduction of advances agricultural techniques for fodder production and hay preparation, feeding practices; - Proper storage of hay and fodder
Establishment of sites for silage production	*Positive*. Better silage production, introduction of advances agricultural techniques, increased mammalian livestock; creating new jobs, contribution to ensuring of food security, contribution to poverty reduction in rural area and generally, to improvement of socio-economic conditions in rural areas, etc. *Adverse*. In the case the silage is located on uninsulated basis there is a possibility for soil and ground water contamination	To avoid the negative impact and to protect the soil and underground waters, it is extremely important to meet a few requirements: (i) Proper Location of silos. Trenches/furrows for filling and storing silage must be built on areas protected from accumulation of precipitations, especially floods; (ii) Silos' sealing. The trenches must be well sealed, both its foundation as well as the walls, with concrete walls and/or thick polyethylene film; (iii) Proper renovation and cleaning of silos; Additional more detailed instructions on management of sites for silage production can be seen in the text.

Component 2: ***Veterinary Services and Animal Health***		
Animal identification and registration	*Positive*. less threats to human health and wildlife; improvement of animal heard; increased export potential	no
Vaccinations of animals	*Positive*. Prevention of inadvertent spread of the animal diseases, better diseases control, less threats to human health and wildlife; improvement of animal heard, reductions in livestock mortality and improved livestock performance; increased mammalian livestock production; contribution to ensuring of food security, contribution to poverty reduction in rural area and generally, to improvement of socio-economic conditions in rural areas, etc. *Adverse*. Increased ground and surface waters pollution due to inappropriate management and disposal of livestock vaccines and other drugs	- Proper handling, application and storage of vaccines; - Use of permitted approved vaccines and recommended application rates, scheduling and mode of application
Use of insecticide/acaricide livestock dips	*Positive*. Reduced risk for human health and wildlife; improvement of animal heard health; prevention of inadvertent spread of the animal diseases, better diseases control; reductions in livestock mortality and improved livestock performance; increased mammalian livestock production; contribution to ensuring of food security, contribution to poverty reduction in rural area and generally, to improvement of socio-economic conditions in rural areas, etc. *Adverse*. Threats to human health and wildlife due to inappropriate management and disposal of livestock vaccines and other drugs	- Proper handling, application and storage of insecticides/acaricides; - Use of permitted/ approved insecticides/acaricides and recommended application rates, scheduling and mode of application
Upgrading the regional veterinary laboratory	*Positive*. Increased disease control, capacity building of veterinary services; reductions in livestock mortality and improved livestock performance. *Adverse*. Increased pollution with wastes, noise, dust, and air pollution, health hazards and labor safety issues, etc., due to civil works.	1. During interior demolition use debris-chutes above the first floor; 2. Keep demolition debris in controlled area and spray with water mist to reduce debris dust; 3. Suppress dust during pneumatic drilling/wall destruction by ongoing water spraying and/or installing dust screen enclosures at site; 4. Keep surrounding environment (side-walks, roads) free of debris to minimize dust; 5. There will be no open burning of construction / waste material at the site; 6. There will be no excessive idling of construction vehicles at sites; 7. Construction noise will be limited to restricted times agreed to in the permit; 8. During operations the engine covers of generators, air compressors and other powered mechanical equipment should be closed, and equipment placed as far away from residential areas as possible;

		9. The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in nearby streams and rivers. 10. Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities. 11. Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers. 12. Construction waste will be collected and disposed properly by licensed collectors 13. The records of waste disposal will be maintained as proof for proper management as designed. 14. Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos).
Veterinary laboratory operation - bio-safety and waste management	*Positive*. Improving veterinary waste management, contribution to ensuring of food security. Adverse. Inadvertent spread of the animal diseases due to improper handling of samples, violation of analytical protocols and safety measures and etc.; improper management of waste generated in up-grated laboratory; lack of staff skills (qualifications) and etc.	- A complete and functioning laboratory bio-risk management system will help ensure that the laboratory is in compliance with applicable local, national, regional, and international standards and requirements for biosafety and laboratory biosecurity. - Management of waste generated in upgraded laboratory facilities using existing national guidelines that are consistent with international good practice; - Trainings for staff on advanced laboratory methods and etc.
Establishment and maintenance of the veterinary posts and associated construction/rehabilitation activities	*Positive*. Improving veterinary waste management; capacity building of veterinary services; reductions in livestock mortality and improved livestock performance. Adverse. Increased pollution with wastes, noise, dust, and air pollution, health hazards and labor safety issues, etc., due to civil works	Best construction practices and following measures: 1. During interior demolition use debris-chutes above the first floor; 2. Keep demolition debris in controlled area and spray with water mist to reduce debris dust; 3. Suppress dust during pneumatic drilling/wall destruction by ongoing water spraying and/or installing dust screen enclosures at site;

		4. Keep surrounding environment (side-walks, roads) free of debris to minimize dust; 5. There will be no open burning of construction / waste material at the site; 6. There will be no excessive idling of construction vehicles at sites; 7. Construction noise will be limited to restricted times agreed to in the permit; 8. During operations the engine covers of generators, air compressors and other powered mechanical equipment should be closed, and equipment placed as far away from residential areas as possible; 9. The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in nearby streams and rivers; 10. Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities; 11. Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers; 12. Construction waste will be collected and disposed properly by licensed collectors; 13. The records of waste disposal will be maintained as proof for proper management as designed; 14. Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos).
Training of farmers in sound manure management, and animal husbandry practices	*Positive*. Improved farmer skills from training in technologies, manure management, introduction of new technologies & quality standards at enterprises, contribute to improvement of socio-economic conditions urban and rural areas, etc.	No
Component 3: ***On-farm Investments***		
Use of pesticides and	Positive. Better agro-chemicals usage; improved soil quality, increased	For pesticides application

fertilizers for improving fodder production	agricultural production; increased rural income; rural economy improved; contribution to country's food security, etc. *Adverse*. Increased ground and surface waters pollution due to use of agro-chemicals; threats to human health and wildlife due to improper handling, application and storage of pesticides; Consumption of crops with high levels of pesticide residues; soil degradation/ Reduction in soil organic content. Soil contamination by residual pesticides in soil leads to loss of soil productivity; long term loss / altered soil micro-fauna important to soil / plant relationships. Loss of biodiversity due to pesticide ingestion by fauna and then loss of fauna. Ground and surface water contamination and therefore threats to health of local and downstream water consumers; increased health costs; lost work time; lost family income, damage to aquatic ecosystems, loss of biodiversity. Air pollution -emissions of greenhouse gases from chemical fertilizers which contribute to global warming resulting in climate change. Water pollution - nutrient enrichment of water bodies from fertilizer runoff leads to Eutrophication of water bodies. Modified aquatic ecosystems. .	- Proper handling and use of pesticides; - Proper storage of pesticides; - Use only approved pesticides; - Sanitary measures (proper cleaning, washing, etc.) - Use of approved pesticides and recommended application rates, scheduling and mode of application (for other pesticide-related measures refer *to Chapter 5*) For Fertilizers application -Apply organic matter, such as manure, to replace chemical fertilizers to the extent practical; -Incorporate manure into the soil or apply between growing crops to improve plant utilization of nutrients and thereby reduce nutrient loss, etc. - Where feasible, use biofuels instead of fossil energy to reduce net GHG emissions; - Adopt reduced tillage options to increase the carbon storage capacity of soils; -Time the application of crop nutrients using meteorological information to avoid, where feasible, application during or close to precipitation events; -Use appropriate technical equipment for spraying manure; -Establish buffer zones, strips, or other "no-treatment" areas along water sources, rivers, streams, ponds, lakes, and ditches to act as a filter to catch potential runoff from the land; - Develop application rates and best land husbandry and crop rotation plans; - Develop and implement the most appropriate to the area land and crop practices (For other pesticide-related measures refer *to Chapter 5*)
Investments in improving the animal heard and shelter	Positive. Fewer animals required for the same production volume and less pressure on pastures; improved quality of production and respective products for markets, including foreign ones; increased farm incomes; improved rural economic situation, etc.; increased production in milk production due to animal heard improvement, which would result in creation	- Prevent animals' access to surface water bodies using fences, buffer strips or other physical barriers; -Prevent overgrazing of pastureland through use of: • Rotational grazing systems based on seasonal

	of new jobs and respectively, and increased income. Indirect positive impacts will relate to overall improving of business environment, contribution to poverty reduction and food safety *Adverse*. Potential expansion of livestock and inadequate manure management	and local ecosystem resilience (e.g. riparian zones); • through properly evaluated pasture capacities, which are from 0,3 conv. cattle capita per ha on degraded lands to 1,5 conv. cattle capita on good lands; - Use of stabling; - Not to pasture in early spring and late autumn; - Use of livestock trails to reduce soil trampling and gully formation; - Ensure minimum disturbance to surrounding areas when managing livestock; - Control farm animals, equipment, personnel, and wild or domestic animals entering the facility; - Vehicles that go from farm to farm should be subject to special precautions such as limiting their operation, etc. - Sanitize animal housing areas; - Identify and segregate sick animals and develop procedures for adequate removal and disposal of dead animals.
Purchasing of inputs and machinery for feed and fodder production	*Positive*. Introduction of new technologies & quality standards at enterprises, use of advanced machinery & equipment, providing additional value to produced agricultural production, providing more food thus ensuring country's food safely; creating new jobs and increased incomes, contribute to improvement of socio-economic conditions urban and rural areas, etc. Reduced labor burden for rural employees; improved farms' efficiency; increased production volume, improved soil preparation, improved rural economic conditions, etc.; reduction of transportation costs and fuel consumption, etc.. *Adverse*. Soil and water pollution due to contamination from machine fuels and lubricants and then loss of soil productivity, decrease of crop production and deterioration of potable water quality; Air pollution due to CO_2 releases which contribute to greenhouse gasses and global warming. Soil erosion because of tillage against the contour and causing increasing of surface runoff and contributing to increased surface water bodies alluviation, reduced soil percolation capacity, etc.	- Good practices to be carried out by equipment operators; - Awareness to operators to refuel under safe conditions; - Agricultural machinery should be kept in good conditions; - Fuels and lubricants are to be stored and handled in devoted areas, etc. - To ensure that all machinery engines are efficient and well maintained; - Tillage on the contour; - Ensure equipment of a size that suitable for soil conditions

	Soil compaction due to use of heavy machinery and leading to soil erosion and alluviation of water bodies, poor water permeability of the soil profile/ decrease of soil moisture, etc.	
Purchasing of agro-processing and milk collection and cooling equipment and associated small scale construction and rehabilitation activities	*Positive*. Increased dairy production, which would result in creation of new jobs and increased income; introduction of advanced dairy technologies and techniques, contribution to poverty reduction and food safety. Introduction of new technologies & quality standards at enterprises, use of advanced machinery & equipment, providing additional value to produced agricultural production, creating new jobs and increased incomes, contribute to improvement of socio-economic conditions urban and rural areas, etc. Reduced labor burden for rural employees; improved farms' efficiency; increased production volume. *Adverse*. increased ground and surface waters pollution due to use of chemicals; increased concentrations of pollutants in wastewater effluents and emissions to air, mostly dust and odor, emissions to air (dust/ particulate matter, often toxic substances), acoustic, vibration, water and energy consumption. During construction/reconstruction activities, the main negative impacts are generated during construction phase and relate to soil erosion, soil and water pollution through waste generation, air pollution, acoustic and aesthetics and asbestos issues; inappropriate handling of asbestos might be a real health	To prevent contamination of wastewater: -Avoid milk, product, and by-product losses; -Install grids to reduce or avoid the introduction of solid materials into the wastewater drainage system; -Adopt best-practice methods for facility cleaning systems, using approved chemicals and / or detergents with minimal environmental impact and compatibility with subsequent wastewater treatment processes -Where possible and subject to sanitary requirements, segregate solid process waste and non-conforming products; -Optimize product filling and packaging equipment to avoid product- and packaging-material waste; -Optimize the design of packaging material to reduce the volume of waste - Plastic waste from packaging cuttings can be reused, or should be sorted as plastic waste for off-site recycling or disposal, etc. Installation of exhaust ventilation equipped with dry powder retention systems (e.g. cyclones or bag filters -Ensure wastewater treatment facilities are properly designed and maintained for the anticipated wastewater load; - Keep all working and storage areas clean; - Empty and clean the fat trap frequently (e.g. daily emptying and weekly cleaning); -Minimize stock of waste and by-products and store for short periods in cold, closed, and well-ventilated rooms -Reduce heat loss by: Using continuous, instead of batch, pasteurizers; Partially homogenizing milk to

	concern for the construction workers, and the general public in the vicinity of the rehabilitated premises in particular when it is inhaled; Labor and safety impacts due to various accidents; health impacts in the case of the usage of noxious/toxic solvents and glues and of lead-based paints and etc.	reduce the size of heat exchangers; Improve cooling efficiency; 1. During interior demolition use debris-chutes above the first floor 2. Keep demolition debris in controlled area and spray with water mist to reduce debris dust 3. Suppress dust during pneumatic drilling/wall destruction by ongoing water spraying and/or installing dust screen enclosures at site 4. Keep surrounding environment (sidewalks, roads) free of debris to minimize dust 5. There will be no open burning of construction / waste material at the site 6. There will be no excessive idling of construction vehicles at sites 7. Construction noise will be limited to restricted times agreed to in the permit 8. During operations the engine covers of generators, air compressors and other powered mechanical equipment should be closed, and equipment placed as far away from residential areas as possible 9. The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in nearby streams and rivers. 10. Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities. 11. Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers. 12. Construction waste will be collected and disposed properly by licensed collectors 13. The records of waste disposal will be maintained as proof for proper management as designed.

		14. Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos)

5. Overview of proposed mitigation measures

The whole range of necessary measures to mitigate adverse project impacts and/or to maximize the positive ones are presented above in the *Table 2* above. They recommended mitigation measures are based on the best international practices as well as on the existing practice in the Kyrgyz Republic. This section of the ESMF focuses on main groups of such measures.

The potential impacts associated with the construction and rehabilitation activities in the case of veterinary laboratory upgrading or construction, installation of veterinary posts, or in the case of rehabilitation/small scale construction of animal shelters and premises for installing of agro-processing equipment will be easily mitigated by ensuring that all civil works will be designed and operated in accordance with environmentally sound engineering practices and governed by the applicable environmental standards of the Kyrgyz Republic. This will be clearly specified in the construction contracts and enforced by the client. Such practices would include the following:

Organizational measures. Before starting the construction/rehabilitation activities it is necessary to inform the local construction and environment inspectorates and communities about upcoming activities in the media and/or at publicly accessible sites (including the site of the works). Furthermore, it is necessary to have in place all legally required permits. All works should be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment. Construction workers should be properly dressed, having when necessary respirators and safety glasses, harnesses and safety boots.

Protection of air quality and dust minimization. During construction/rehabilitation activities it is necessary to use debris-chutes above the first floor and to keep demolition debris in controlled area, spraying with water mist to reduce debris dust. It is also necessary to suppress dust during pneumatic drilling/wall destruction by ongoing water spraying and/or installing dust screen enclosures at site. It is strictly prohibited burning of construction/waste material at the site. For the transportation of any other dusty material to the rehabilitation site watering or covering of the cargo should be implemented. Reduction of dust on rehabilitation site during dry season of the year can be accomplished by watering the ground surface. Workers that perform the works should be introduced with protective closes and respirators.

Noise reduction. Before any beginning of the work it is recommended to inform all potentially affected parties and especially the neighbors either directly or through local billboards or newspapers on the rehabilitation activities. The noise should be limited by using good management practice and limiting works on regular daily shift (during the vacation time) and or after the school classes. The construction equipment and machinery used should be calibrated according to the Noise Standards.

Construction wastes and spills. As a general requirement is that the existing building elements to be rehabilitated (walls, ground cement slabs etc.) should be carefully rehabilitated and the construction wastes should be sorted and removed in an organized way and disposed on an authorized land filed. All valuable materials (doors, windows, sanitary fixtures, etc.) should be carefully dismantled and transported to the storage area assigned for the purpose. Valuable materials should be recycled within the project or sold. Wastes where ever possible should be minimized, separated and handled accordingly. When wastes are separated they are more manageable. Some materials like doors or ceramics sinks might be usable on the site again. Non-usable materials should be taken to appropriate place for recycling. For non-recyclable wastes, in agreement with local councils the wastes will be deposited on authorized landfill. Open burning and illegal dumping of any waste is strictly prohibited. In addition to solid wastes, some amounts of

hazardous wastes will be produced on the site: like the remaining from paints, enamels, oiled packaging, oils, material contaminated with oil, insulation material, etc., which have to be collected and handed over to the local self-government body authorized for collection and transportation of hazardous waste.

Asbestos issues. The general approach while handling this material is that constructors avoided crushing/destruction of asbestos plates from the roofs and or from the walls insulation and deposited them in an organized manner on the construction sites. Also the constructors should avoid releasing asbestos fibers into the air from being crushed. It is also imperative while working with asbestos plates the workers have to wear special closing, gloves and respirators. If the use of asbestos-containing materials (ACM) it is anticipated for the roof renovation, it is necessary to provide brief information about alternative non-asbestos materials, their availability and the rationale for the material choice made. Once the presence of ACM in the existing infrastructure has been presumed or confirmed and their disturbance is shown to be unavoidable, incorporate the following requirements in the EMP for construction works:

- Develop a plan for doing works involving removal, repair and disposal of ACM in a way that minimizes worker and community asbestos exposure. The plan should include: (i) Containment of interior areas where removal will occur in a negative pressure enclosure; (ii) Protection of walls, floors and other surfaces with plastic sheeting; (iii) Removal of the ACM using wet methods and promptly placing the material in impermeable containers; (iv) Final clean-up with vacuum equipment and dismantling of the enclosure and decontamination facilities; (v) Disposal of the removed ACM and contaminated materials in an approved landfill; (vi) Inspection and air monitoring as the work progresses, as well as final air sampling for clearance, by an entity independent of the contractor removing the ACM;
- Require that the construction firms/and or individuals employed during the construction have received training in relevant health and safety issues;
- Provide for all construction workers with personal protection means, including respirators and disposable clothing;
- Require that the beneficiary or the selected contractor notifies authorities of the removal and disposal according to applicable regulations and cooperates fully with representatives of the cognizant agency during all inspections and inquiries.

Temporary storage of materials (including hazardous). Stockpiling of construction material should be avoided if possible. If not, construction material should be stored on the construction site, and protected from weathering. Hazardous materials like paints, oils, enamels and others should be kept on impermeable surface, and adsorbents like sand or sawdust should be kept for handling small spillage.

Ensuring workers health and safety. The personal should have protective equipment, rubber gloves, respirators, goggles and breathing mask with filter, as well as helmets. Prior starting civil works, all workers have to pass labor safety training course. In addition, it is necessary to carry out the routine inspection of the machinery and equipment for purpose of the trouble shooting and observance of the time of repair, training and instruction of the workers engaged in maintenance of the machinery, tools and equipment on safe methods and techniques of work. Special attention should be paid to welding operations. It is prohibited to distribute the faulty or unchecked tools for work performance as well as to leave off hand the mechanical tools connected to the electrical supply network or compressed air pipelines; to pull up and bend the cables and air hose pipes; to lay cables and hose pipes with their intersection by wire ropes, electric cables, to handle the rotating elements of power driven hand tools.

Ensuring bio-safety and waste management and preventing inadvertent spread of the animal diseases. The Project will finance essential equipment, consumables and reagents, staff training and technical assistance for the veterinary laboratory in Karakol and veterinary posts to be installed. A particular focus of the training activities will be on laboratory waste management by basing training and upgrades to laboratory infrastructure and equipment on "International Best Practice in Safety of Research Laboratories" developed by the US National Institutes of Health (see *Annex 1*). Design of upgrades for veterinary laboratory and posts will include facilities for safe disposal of wastes and contaminated materials. Construction and renovation works associated with rehabilitation of laboratory and veterinary posts will be carried as specified above, ensuring the implementation of all mitigation measures specified in the EMP Checklist (See *Annex 7*). The EMP Checklist will be included as part of the construction/rehabilitation contracts. In addition, waste generated in upgraded laboratory facilities will be managed using existing national guidelines that are consistent with international good practice.

Preventing environmental pollution and ensuring sound manure management. Proper manure management refers to capture, storage, treatment, and utilization of animal manures in an environmentally sustainable manner. It can be retained in various holding facilities. Animal manure (also referred to as animal waste) can occur in a liquid, slurry, or solid form. It is utilized by distribution on fields in amounts that enrich soils without causing water pollution or unacceptably high levels of nutrient enrichment. Manure management is a component of nutrient management.

One of the key factors of animal waste management is the design of one or more storage structures (ponds, tanks, and/or dry stacks) that can store the waste generated for time period recommended by the state and local regulatory agency.

To address all of the pollution risks associated with manures, slurries and grazing animals, particularly in bathing water catchments, it is essential to apply following approaches, the main individual components of which are as follows:

- minimizing dirty water around the steading;
- better nutrient use;
- a risk assessment for manure and slurry;
- managing water margins.
- avoid spreading close to domestic or public buildings;
- spread livestock slurries and manures when the wind direction is away from public/residential areas and areas designated for their conservation value;
- avoid, where possible, spreading in the hours of darkness.
- locate any field heap of farmyard manure:

- at least 10m away from any clean surface water or field drain or watercourse and at least 50m from any spring, well or borehole; and
- as far away from residential housing as possible.

- spread livestock manures only when field and weather conditions are suitable to prevent water pollution.

Pollution risk can occur at all stages of handling livestock slurry and manures, including collection, storage, transportation and land application. At all times, the quantity of material requiring to be collected, stored and applied to land should be minimized. The risk of pollution occurring is usually higher with liquid systems than with solid based systems. Minimize the unroofed steading areas to which stock have access, or alternatively roof these areas where

practical. It is needed always to separate uncontaminated water from dirty water and prevent it from entering the handling system.

Many farms have existing drainage systems to allow run-off from roads and yards to discharge to local watercourses. This drainage can carry silt, chemicals, Fecal Indicator Organisms [FIOs] and other materials, thereby causing a risk of pollution. It may be possible to make use of properly sited and designed ponds to deal with this currently uncollected drainage and minimize pollution risks. Farmers should draw up a Manure Management Plan (also known as Farm Waste Management Plans). Professional advice should be provided from relevant (mandated) agencies.

There are also other examples of mitigation measures that can be followed[19].

Implementation of project trainings activities for capacity building and knowledge improvement in area of sound manure management, proper and advanced feeding practices, application of IPM approaches and etc., can also ensure positive environmental impacts on pastures status.

Environmental assessments for proposed sub-projects in area of fodder production or animal breeding or other will be conducted which will take into account existing pastures which can be potentially affected both negatively or positively, and site specific environmental management plan with mitigation measures will be developed as a part of EA report. The project would support additional TA activities to strengthen the existing institutional capacities to ensure that effective EAs are conducted, EMPs are implemented properly and monitoring systems are put in place.

Involved parties will have responsibilities on implementation of specific EMP and mandated bodies (persons) will conduct relevant monitoring on regular basis.

Preventing ground water pollution by silage "liquor". The ensiling process as a biological process can also have negative effects on the environment. To avoid the negative impact and to protect the soil and underground waters, it is extremely important to meet a few requirements:

(i) Proper location of silos. Trenches/furrows for filling and storing silage must be built on areas protected from accumulation of precipitations, especially floods, but groundwater too should be deeper than 4-5 meters from the basis of the construction.

(ii) Silos' sealing. The trenches must be well sealed, both its foundation as well as the walls, with concrete walls and/or thick polyethylene film. Lateral walls and the walls at the entrance into the trench must be higher than the ground level to avoid accumulation of water from precipitation drain. For these purposes, concrete trenches, soil furrows at a small depth completely covered with polyethylene film which would not permit the drainage of plant juice into the soil can be recommended. Also, plastic containers and polyethylene bags can be used for ensiling, which should be also sealed and will not permit liquids to drain or gases to dispose.

(iii) Renovation and cleaning of silos. After emptying the silos, there are residues of spoiled feed, which are a favorable environment for developing rotting bacteria, molds, etc. It is necessary to clean the silos 2-3 weeks before ensiling and if necessary to renovate the capacities where feed will be ensiled. After cleaning and renovation, it is mandatory to disinfect the trenches and other stock houses for silage storage, with 5% slaked lime or 1% copper sulphate or other chemicals recommended for the disinfection of succulent feed silos. Demonstrational plots will be used show how the concrete trenches can

[19] http://www.gov.scot/Publications/2005/03/20613/51370

cleaned, renovated and disinfected with 5% slaked lime before the harvesting of silage corn, for example.

(iv) Harvesting of corn for ensiling. For a good conservation and for making quality silage, it is necessary that corn plants are harvested at the time of maximal quantitative productivity and the highest content of nutrients. This is when the corn plant humidity is 60-70% and the phase of corn grains' ripening is milk-dough. If the humidity is higher than 70%, then substantial quantities (up to 10-15% of total mass) of juices from plants dispose during the compaction of the ensiled mass. This leads to a worsening of the silage quality, a reduction in the contents of nutrients, but can also favor environmental pollution, especially of groundwater.

(v) The shredders used for harvesting must assure small chopping of corn plants (1-3 centimeters length), while corn grains must be smashed too. Shredders of such producers as "Speru New Holland" shredder for harvesting the corn, the Turkish manufactured shredder "CELMAK" or similar can be recommended for the correct chopping of plants and corn grains.

(vi) Compaction of the corn mass must be done properly and concomitantly with the filling of chopped plants. On the demonstrational plots, compaction can be done by wheel tractors, with feet under one's own weight and by hand with a wood log with metal. For compacting corn mass the tractor can be used provided that the size of the trench (polyethylene film sleeve is much bigger than in the experiments on the demonstrational plots).

(vii) Sealing of silage must be done in a few days to eliminate the air at maximum, to prevent undesired fermentation and to avoid aerobic processes which can favor mold and toxic substances.

(viii) If during the ensiling period rains, the process of harvesting and storage must be stopped, while the silos (trenches) shall be temporarily preserved – covered with polyethylene film that must be fixed well. Special roof made of metal and metal tiles can be arranged to protect the silage from precipitation and frosts.

(ix) To avoid the deterioration of the film by rodents, after the corn mass is covered, on top of the cover lime can be powdered, and to avoid the freezing of the layer of soil and upper layer of silage, the trench must be covered with a 50-60 cm layer of straw before the first frost.

(x) The corn silage taken out of the trenches and other storage facilities does not stand prolonged storage. This is why a quantity equal to the daily norm of animal nutrition will be extracted on daily basis. Every time after part of the silage is taken the storage facilities must be thoroughly closed to avoid air access as much as possible.

(xi) Wells located within 150 feet to silage storage should be routinely checked for contamination such as nitrates and E.coli.

(xii) Farmers can implement practices to reduce the amount of leachate produced and its impact on the environment. Make sure that the moisture content of corn silage is between 65% and 70% for bunkers. Moisture levels may be even lower for corn silage stored in upright silos, though it should not fall below 62%. Alfalfa haylage should be harvested at 60% to 70% moisture content Contact between silage and water can be minimized by utilizing plastic covers to divert water off of the silage area.

(xiii) Make sure that the water is not running along the sides of the bunker and coming into contact with feed. If these measures are not enough to impede leachate movement off

site then engineered practices need to be implemented. Grassed filter strips or diverting leachate into an existing or new holding facility may be needed.

Strict respect of these requirements will assure absolute avoidance of the negative impact of corn silage on the environment for the simple reason that it would not permit the generation of the so-called "silage juice". Moreover, only respecting these rules silage with good organoleptic qualities, of a dark yellow color, smelling of sour bread and which animal eat with pleasure can be received.

However, if for certain reasons, one or more ecological requirements will be violated somehow and if silage juice will appear and accumulate in silage, it is extremely important to remove these as soon as possible. Silage juices should be collected and diluted 1:10 in good irrigation water. This solution can be used as liquid fertilizer on fields with feed plants, cereals or technical crops. It is less recommended to use it for perennial fruit crops and one must avoid the use of this fertilizer for vegetables and cucurbits crops.

Safe agricultural chemicals management

General remarks. Although the project will not support purchasing and use of mineral fertilizers and pesticides, the farmers routinely use acaricides to control ticks and other ectoparasites. Furthermore, to a limited extent they also purchase on their own agro-chemicals for improved fodder production which might cause impacts on the environment and on the farmers' health. By reducing pesticide use, mammalian livestock production operators may reduce not only the environmental impacts of their operations, but also production costs. Pesticides should be managed to avoid their migration into off-site land or water environments by establishing their use as part of an Integrated Pest Management (IPM) strategy and as documented in a Pesticide Management Plan (PMP). The following stages should be considered when designing and implementing an IPM strategy, giving preference to alternative pest management strategies, with the use of synthetic chemical pesticides as a last option.

The objective of ESMF in this regard is to encourage adoption of Integrated Pest Management approach and increase beneficiaries' awareness of pesticide-related hazards and good practices for safe pesticides use and handling. This will be done by providing relevant information dissemination and training. Below are presented key issues that should be reflected in the training curricular.

Principles of the Integrated Pest Management[20]. The primary aim of pest management is to manage pests and diseases that may negatively affect production of crops so that they remain at a level that is under an economically damaging threshold. Pesticides should be managed to reduce human exposure and health hazards, to avoid their migration into off-site land or water environments and to avoid ecological impacts such as destruction of beneficial species and the development of pesticide resistance. The IPM consists of the judicious use of both chemical and nonchemical control techniques to achieve effective and economically efficient pest management with minimal environmental contamination. IPM therefore may include the use of: a) Mechanical and Physical Control; b) Cultural Control; c) Biological Control, and d) rational Chemical Control. Although IPM emphasizes the use of nonchemical strategies, chemical control may be an option used in conjunction with other methods. Integrated pest management strategies depend on

[20] This section is based on the World Bank Group in the Environmental, Health, and Safety Guidelines prepared in 2007.

surveillance to establish the need for control and to monitor the effectiveness of management efforts.

Alternatives to Pesticide Application. Where feasible, the following alternatives to pesticides should be considered:

- Rotate crops to reduce the presence of pests and weeds in the soil ecosystem;
- Use pest-resistant crop varieties;
- Use mechanical weed control and / or thermal weeding;
- Support and use beneficial organisms, such as insects, birds, mites, and microbial agents, to perform biological control of pests;
- Protect natural enemies of pests by providing a favorable habitat, such as bushes for nesting sites and other original vegetation that can house pest predators and by avoiding the use of broad-spectrum pesticides;
- Use animals to graze areas and manage plant coverage;
- Use mechanical controls such as manual removal, traps, barriers, light, and sound to kill, relocate, or repel pests.

Pesticide Application. If pesticide application is warranted, users are recommended take the following actions:

- Train personnel to apply pesticides and ensure that personnel have received applicable certifications or equivalent training where such certifications are not required;
- Review and follow the manufacturer's directions on maximum recommended dosage or treatment as well as published reports on using the reduced rate of pesticide application without loss of effect, and apply the minimum effective dose;
- Avoid routine "calendar-based" application, and apply pesticides only when needed and useful based on criteria such as field observations, weather data (e.g. appropriate temperature, low wind, etc.),
- Avoid the use of highly hazardous pesticides, particularly by uncertified, untrained or inadequately equipped users. This includes:
- Pesticides that fall under the World Health Organization Recommended Classification of Pesticides by Hazard Classes 1a and 1b should be avoided in almost all cases, to be used only when no practical alternatives are available and where the handling and use of the products will be done in accordance with national laws by certified personnel in conjunction with health and environmental exposure monitoring;
- Pesticides that fall under the World Health Organization Recommended Classification of Pesticides by Hazard Class II should be avoided if the project host country lacks restrictions on distribution and use of these chemicals, or if they are likely to be accessible to personnel without proper training, equipment, and facilities to handle, store, apply, and dispose of these products properly;
- Avoid the use of pesticides listed in Annexes A and B of the Stockholm Convention, except under the conditions noted in the convention and those subject to international bans or phase outs;
- Use only pesticides that are manufactured under license and registered and approved by the appropriate authority and in accordance with the Food and Agriculture Organization's (FAO's) International Code of Conduct on the Distribution and Use of Pesticides;
- Use only pesticides that are labeled in accordance with international standards and norms, such as the FAO's Revised Guidelines for Good Labeling Practice for Pesticides;

- Select application technologies and practices designed to reduce unintentional drift or runoff only as indicated in an IPM program, and under controlled conditions;
- Maintain and calibrate pesticide application equipment in accordance with manufacturer's recommendations. Use application equipment that is registered in the country of use;
- Establish untreated buffer zones or strips along water sources, rivers, streams, ponds, lakes, and ditches to help protect water resources;
- Avoid use of pesticides that have been linked to localized environmental problems and threats.

A copy of the national pesticide registration list is attached below in *Annex E*.

Pesticide Handling and Storage. Contamination of soils, groundwater, or surface water resources, due to accidental spills during transfer, mixing, and storage of pesticides should be prevented by following the hazardous materials storage and handling recommendations. These are the following:

- Store pesticides in their original packaging, in a dedicated, dry, cool, frost-free, and well aerated location that can be locked and properly identified with signs, with access limited to authorized people. No human or animal food may be stored in this location. The store room should also be designed with spill containment measures and sited in consideration of potential for contamination of soil and water resources;
- Mixing and transfer of pesticides should be undertaken by trained personnel in ventilated and well lit areas, using containers designed and dedicated for this purpose.
- Containers should not be used for any other purpose (e.g. drinking water). Contaminated containers should be handled as hazardous waste, and should be disposed in specially designated for hazardous wastes sites. Ideally, disposal of containers contaminated with pesticides should be done in a manner consistent with FAO guidelines and with manufacturer's directions;
- Purchase and store no more pesticide than needed and rotate stock using a "first-in, first-out" principle so that pesticides do not become obsolete. Additionally, the use of obsolete pesticides should be avoided under all circumstances; a management plan that includes measures for the containment, storage and ultimate destruction of all obsolete stocks should be prepared in accordance to guidelines by FAO and consistent with country commitments under the Stockholm, Rotterdam and Basel Conventions.
- Collect rinse water from equipment cleaning for reuse (such as for the dilution of identical pesticides to concentrations used for application);
- Ensure that protective clothing worn during pesticide application is either cleaned or disposed of in an environmentally responsible manner
- Maintain records of pesticide use and effectiveness.

Safety issues in mineral fertilizers usage and handling. Similarly as in the case of usage of pesticides, fertilizers usage may provide important benefits, they also pose certain risks associated with accidental expose of environment and of farmers during their inappropriate handling and usage. To avoid adverse environmental impacts while using mineral fertilizers it is necessary to comply strictly with a series of requirements, stipulated in the existing legal documents as well as in the fertilizers Guidelines for their handling. The rules and procedures of production, storage, transportation and usage of the mineral fertilizers are reflected in a relatively small number of documents, and most of them were adopted at the time of the USSR.

Main requirements while using mineral fertilizers. The usage of different mineral fertilizers should be done depending on such factors as type and quality of the soil, type of the crop, system of crop rotation, weather and climate conditions, ways and terms of their application.

Provisions with regard to fertilizers storage:

- Keep stocks of fertilizers, and soil amendment materials to the minimum required.
- Ensure that the storage facility is appropriately secured.
- Fertilizers and soil amendment materials are not to be stored in contact with ground surfaces.
- Storage areas/facilities are to weather-proofed and able to exclude runoff from other areas.
- Do not store in close proximity to heat sources such as open flames, steam pipes, radiators or other combustible materials such as flammable liquids.
- Do not store with urea.
- Do not contaminate fertilizers, and soil amendment materials with other foreign matter.
- In case of fire flood the area with water.
- If augers are used to move the material ensure that any residue(s) in the immediate area is cleaned up.
- Dispose of empty bags in the appropriate manner.

Provisions with regard to fertilizers field usage:

- Keep fertilizer amounts to a minimum and covered to avoid unnecessary expose to open air.
- Keep spreaders and air seeders that are left in the field overnight covered.
- Cover spreader and air seeders between jobs.
- Ensure that the drill, air seeder and/or fertilizer box is completely empty at the end of each day. If the drill, air seeder and/or fertilizer box cannot be fully emptied fill to capacity prior to storage for the night.
- Do not store dry urea with dry ammonium nitrate.

Ensuring minimization of hazards associated with inappropriate handling and usage of fertilizers: The *Table 3* below provides information about typical hazard scenarios that that may arise in conjunction with the procurement, handling and storage of fertilizers as well as the recommended measures to control the potential risks.

Table 3. Typical hazard scenarios and recommended measures

Likely Hazard Scenario	Recommended Control Strategy
Spillage	Ensure all storage areas and/or facilities are secure and appropriate. Ensure all fertilizer products can be contained within the storage area and/or facility selected. Provide appropriate equipment and materials to clean up a spillage
Transportation and delivery of goods	Cover any loads of fertilizer products whilst in transit. Ensure that deliveries of fertilizer products are made at appropriate times. Do not accept any containers of fertilizer products that are damaged and/or leaking. Ensure that any spillages that occur during delivery are cleaned up appropriately.
Drift of dust from storage areas and/or facilities	Keep fertilizer products covered and/or sealed. Clean up spillages promptly. Keep "in use" stocks to the minimum required. Staff responsible for storage areas and/or facilities to will ensure that the drift of dust beyond the perimeter is kept to a minimum.
Storage areas - Floors	Keep floor surfaces swept clean of fertilizer to prevent tracking by people and/or vehicles beyond the perimeter. Sweep up and dispose of spillages in a timely and appropriate manner.
Cross contamination of	Keep each fertilizer product will in a separate storage container and/or position within the facility and/or area.

product	
Confusion of Product	Maintain an accurate storage manifest/register. Keep products and blends are segregated at all times. Ensure all storage bays and bins are clearly labeled. Ensure all storage, loading and blending plant and equipment is cleaned from all residues when changing from one product to another. Do not store product in bags that are not correctly stamped.
Occupational Health and Safety	Contact between fertilizer products, people and livestock will be minimized.
Risk Assessments	Risk Assessments are required to be conducted on the procurement, storage and handling of fertilizer products.
Contact with people and livestock	Managers will develop, implement and monitor the effectiveness of hazard management procedures. All persons using fertilizer products are to adhere to the hazard management procedures and adopt safe working practice and ensure that direct contact with fertilizer and the inhalation of fertilizer dust is minimized. Managers are to ensure that staff is made aware of any national and industry regulations which have to be observed.
Personal Protective Equipment	Staff must be provided with appropriate PPE when using fertilizer products.
Lack of appropriate warning safety signage and information	Managers must ensure that appropriate safety warning signs and/or information is displayed/ available regarding nature of hazards and risk control measures.
Poor housekeeping and/or routine maintenance	All staff is responsible for implementing sound housekeeping practices in storage areas and arranging regular routine maintenance for all equipment used.
Defective &/or unserviceable plant & equipment	Conduct regular inspection & testing of equipment and infrastructure to identify what maintenance requirements
Incorrect or inappropriate mixtures of product	Fertilizer blends to be prepared using the right raw materials in the appropriate proportions. All products will be loaded into spreaders etc., in the right condition to the right weight.
No training	Staff will undertake appropriate training.
Lack of appropriate records &/or documentation	All relevant records and documentation to be kept and maintained e.g. training records, risk assessments, maintenance schedules, recipes for fertilizer blends, MSDS's etc.

Ensuring safe application of acaricides. To reduce the impacts of ticks and other ectoparasites farmers routinely use Acaricides which are applied through, dipping, spraying, spot treatment or hand dressing.

Dipping provides a highly effective method of treating animals with Acaricides for the control of ticks. The disadvantage of this method however is the initial construction cost and the cost of Acaricide which make this method unattractive for small scale ranching operations. The method involves immersion of animals in a dipping tub containing solution of chemicals.

The spraying method of tick control is not as efficient as dipping. It involves the use of fluid Acaricides applied to animals by means of a spray. The spraying equipment is portable and needs only small amounts of Acaricides to be mixed for the application. The Acaricides may not be

thoroughly applied to all parts of the animal body hence it is less efficient than the dipping method of application. The 2 methods mentioned above, dipping and spraying may not exposed ticks in the inner parts of the ear, under part of the tail, the tail brush and the areas between the teats and the legs in cattle with large udder, to the Acaricides and hence may escape treatment.

The process of applying Acaricides to these areas by hand is termed hand dressing or spot treatment. The advantage here is that the method is more effective and economical in terms of cost of Acaricide as spot treatment is restricted to only selected areas instead of the whole animal. The disadvantage however is that the process is time consuming and laborious.

To reduce inappropriate handling and improve usage of acaricides and anti-helminthes at recommended doses, the labeling of parasiticides in the project area should be packaged in suitable containers with instruction in the national/Russian language, include the use of containers graduated by pictorial symbols or pictograms illustrating animal size and corresponding quantities of the drug required for treatment. Also biological and integrated parasite management methods should be encouraged and taught to rural farmers to reduce the use of pervasive veterinary parasiticides. Stringent policies and efforts by Government of KgR are also required to regulate the importation, distribution and marketing of agro-chemicals.

All specified measures will be promoted via the training Program supported under the project.

Pasture degradation prevention measures. As specified above the potential impacts in this regard are positive. Mitigation measures here will also go in line with the pasture improvement activities implementing in Issyk-Kul and Naryn oblasts within IAFAD project "Livestock and Market Development Project" – on-going project 2014-2018. The project aimed to increase livestock productivity in Issyk-Kul and Naryn Oblasts, and includes components which would improve the productivity, use and access to the pastures and also would strengthen and build the capacity of national level institutions to help develop a cadre of technically qualified specialists in pasture management and improvement. Pasture Committee (PC) and Pasture Users Union (PUU) are the key resource at the community level to facilitate improvements in animal health and productivity. Findings, practices and educational kit of this project can be used also as a part of pasture degradation prevention measures.

Other prevention measures include: good pasture management through rotational grazing are potentially the most cost effective ways to reduce and offset GHG emissions. The resultant increases in vegetation cover and soil organic-matter content sequester carbon, while inclusion of high-quality forage in the animals' diet contributes to reducing methane emissions per unit of product. Improved grazing management also generally improves the profitability of production, proper handling of seeds. Feed efficiency can also be increased by improving herd health through improved veterinary services, preventive health programs and improved water quality. Intensification of pasture management and feed production can reduce the land requirements per unit of animal product produced, thus curbing land-use expansion. Intensification alone is not sufficient, however, and complementary measures are required

Mitigation of potential impacts of the dairy – processing activities. Production of cheese, yogurt, butter and other dairy products are associated with waste waters, solid waste management, emissions and labor safety. These require typical mitigation measures, well known which include the following:

- Avoid milk, product, and by-product losses;

- Install grids to reduce or avoid the introduction of solid materials into the wastewater drainage system;

-Adopt best-practice methods for facility cleaning systems, using approved chemicals and / or detergents with minimal environmental impact and compatibility with subsequent wastewater treatment processes;

-Where possible and subject to sanitary requirements, segregate solid process waste and non-conforming products;

-Optimize product filling and packaging equipment to avoid product- and packaging-material waste;

-Optimize the design of packaging material to reduce the volume of waste;

- Plastic waste from packaging cuttings can be reused, or should be sorted as plastic waste for off-site recycling or disposal, etc.

Measures to be taken to minimize potential negative environmental impacts depend on their type, magnitude, combination and distribution. All of them are expected to be typical, temporary by nature and site specific and can be easily mitigated by applying relevant mitigation measures.

Furthermore, the project would support additional TA activities to strengthen the existing institutional capacities to ensure that effective EAs are conducted, EMPs are implemented properly and monitoring systems are put in place. Of particular attention would be those activities resulting in water, soil and air pollution, and soil erosion.

Prevention and response-focused activities are expected to have a positive environmental impact, as the investments in facilities, equipment, and training for veterinary and public health service staff and laboratories will improve the effectiveness and safety over existing animal diseases handling and testing procedures by meeting international standards established by the World Organization for Animal Health (OIE) and the World Health Organization (WHO).

6. Curricular for environmental TA activities

As specified above dairy sector potential impacts and impacts of the project activities can be directly mitigated by applying a series of measures, among them are also raising public awareness and providing training on management of environmental problems for all involved parties. In this regard the project would support a series of training, preparing and disseminating guidebooks and implementing demonstration activities on sector environmental related issues and in particular:

Education of veterinary specialists on managing sector environmental and social impacts. Such training will include the following topics: environmental issues of project activities; prevention of spreading animal diseases; veterinary waste management in accordance with existing national guidelines; “International Best Practice in Safety of Research Laboratories” developed by the US National Institutes of Health; proper and safe handling and storage of contaminated materials; health protection and feeding of animals; issues of diagnostics, treatment and prevention of brucellosis, tuberculosis, echinococcosis, anthrax, foot-and-mouth disease, pox, issues of appropriate disposal of carcasses of dead animals, etc. Veterinary specialists will pass labor safety training course.

Sound manure management. This would include animal waste management systems involve the collection, transport, storage, treatment, and utilization to reduce migration of contaminants to surface water, groundwater, and air; internationally recognized guidance, such as that published by FAO, on land requirements for livestock production for livestock units (LU) per hectare (ha) to

ensure an appropriate amount of land for manure deposition; feeding diets for livestock, measures to reduce methane generation and emission follow, other pollution preventive measures and etc..

Practicing large and/or small scale silage production and measures to ensure appropriate handling and disposal of the "silage liquor", preventing soil and ground water pollution. In Kyrgyz Republic there is a tradition of corn silage production, but only on a large scale. However, this technology could be applicable also to small-scale farmers and can significantly increase the capacity to feed animals compared to corn grain. Having the appropriate knowledge about the silage production techniques and the timing of their application is an important factor with significant implications on the capacity to feed animals. The training will also cover environmental concerns: if excessively humid corn is used to prepare silage, it can produce a toxic "silage liquor". Thus the training should produce a special guidebook and a training module to clearly explain that the correct level humidity of corn is essential to produce quality silage and avoid the risk of "silage liquor".

Promoting Integrated Pest Management in fodder production. Farmers should be trained on following items: adverse environmental impacts and risks of chemical pesticides; Principles of the Integrated Pest Management and alternative pest management strategies; pest control methods; IPM approaches and good management practices; apply pesticides according to planned procedures, while using the necessary protective clothing; what pesticides can be used; application, handling, usage and storage of pesticides; implementation of PMP plans as part of EMPs. Relevant publications, booklets and instructions should be developed and published for further use. Demonstration plots will be applied.

Ensuring safe usage of acaricides in animal health. Farmers should be trained on following items: advanced technics of handlings, application and storage of acaricides; OHS issues; environmental risks and mitigation issues, etc. Relevant publications, booklets and instructions should be developed and published for further use. Demonstration plots will be needed. Educational Center (NGO) located in Issyk-kul district (Cholpon-Ata) can be used for these purposes.

Sustainable management of dairy-processing related environmental problems. Target group of trainees are farmers applied for sub-projects financing. Following items will be included from training and awareness activities: what occupational health and safety hazards related dairy-processing (Exposure to physical hazards; Exposure to chemical hazards; Exposure to biological agents; Confined spaces); recognizing of mentioned risks and typical mitigation measure, etc. Relevant publications, booklets and instructions should be developed and published for further use. Demonstration plots will be needed. Educational Center (NGO) located in Issyk-kul district (Cholpon-Ata) can be used for these purposes.

7. Guidelines for Environmental Assessment of potential sub-projects

These Guidelines would serve as a guiding document for conducting Environmental Assessment (EA) of the proposed matching grants and sub-projects and to ensure consistency with national environmental requirements as well as World Bank policy. Accordingly, it is proposed that each demonstrational activity under the first component and proposed sub-project for Diary Value Chain Investments (referred to as "Investments") will be assessed for its environmental impacts. EA will be included into the standard cycle of project development on all investments financed within project, starting from the initial identification of investments with further review and approval by technical personnel of CLMU and finishing with the implementation of investments under the supervision of CLMU/ABCC Environmental Specialist (ES). Each project proposal will contain a preliminary description of potential impacts including: likelihood of its impact on the quality of

land and soil, air, natural habitat of a special importance, forests, rare or endangered biological species, potential damage to the water courses or underground sources of water, etc. Moreover, if natural resources are used within the project, one will specify whether it will cause accumulation of wastes and pollutants that usually appear during rehabilitation works and other processes, and whether the project includes activities on agricultural pest control that would employ chemicals, etc. Depending on the nature and scale of impact, the CLMU ES will inform sub-project initiators on the need for environmental assessment documentation. In those cases when potential risks are insignificant they will be addressed via well know generic mitigation measures to be specified in the sub-project proposal while in the case of more significant impacts, there might be required conducting an EIA and or preparing a simple EMP to be reviewed and approved by the state ecological expertize (SEE) within the Kyrgyz legislation to prevent potential adverse impacts of the planned activities on the people's health and environment.

The key steps in the EA process is outlined below:

Step 1. Design: Sub-project initiators will make contracts with local design consultants to prepare a full design/plan providing short description of expected potential impacts (filling out in this regard the Initial Environmental Screening Checklist, see *Annex 2*), that will be submitted to the participating commercial banks and then reviewed and approved by CLMU ES. Typically the designed proposal would include an environmental section[21] describing the key environmental features of the project site, whether critical natural habitats, or rare and endangered species are likely to be impacted, whether water courses or groundwater sources will be affected, the type of natural resource abstraction and use the project will entail, waste materials and polluting substances likely to be generated during construction and operation, whether the project will involve pest management, etc. The sub-project initiators also will be also responsible for the acquisition of relevant permits that can be required by legislation and local authorities.

Step 2. Environmental Screening: Screening of each proposed project for funding is to be undertaken in order to determine the appropriate extent and type of Environmental Assessment. The attribution of the project type to WB's EA category and respectively, environmental risk that might be generated (i.e., high risk – by the Category A sub-projects; from moderate to low risk – by the Category B sub-projects, and from low to no risk - by the Category C sub-projects) is to some extent, an expert judgment. Generally, as described above, the significance of impacts and the selection of screening category accordingly, depend on the *type* and *scale* of the sub-project, the *location* and *sensitivity* of environmental issues, and the *nature* and *magnitude* of the potential impacts. Examples of sub-projects that fall under Categories B and C are provided in the *Table 4 below*. However, this list is just a starting point and framework for the screening decision. Because of other factors involved such as project sub-sitting, the nature of impacts, and the need for the EIA process to be flexible enough to accommodate them, the lists should not be used as the sole basis for screening.

Table 4. Screening categories for proposed types of sub-projects

Proposed activities	*Suggested Environmental Category*	*Remarks*	*Proposed EA instrument*
Purchasing seeds, other inputs, equipment	C		No further actions after filling the Environmental Screening

[21]The project Operational Manual will include the format and content of the environmental section of the On-Farm Investments proposals.

			Checklist
Demonstration farms/household high quality fodder production, hay preparation, feeding practices	C		No further actions after filling the Environmental Screening Checklist
Establishment of sites for silage production	C/B	In the case of large scale (for more than 50 animals) – the project should be qualified as Category B	Depending on environmental sensivity of location and scale of project it might be used a simple EIA and EMP and/or an EMP or an EMP Checklist
Animal identification and registration	C	These activities do not require environmental screening	
Vaccinations of animals	C	These activities do not require environmental screening	
Upgrading the regional veterinary laboratory and	B		EMP Checklist
Establishment of the veterinary posts and associated construction/rehabilitation activities	B		EMP Checklist
Training of farmers in sound manure management and animal husbandry practices	C	These activities do not require environmental screening	
Purchasing and installing milk collection and cooling equipment	C/B	In the case of installing equipment in the existing premises without civil works it would be category C and with such works – Category B	For Category B – EMP Checklist
Purchasing and operating of agro-processing equipment (production of cheese; butter; yogurt; etc.)	B		Depending on environmental sensivity of location and scale of project it might be used a simple EIA and EMP and/or an EMP or an EMP Checklist
Refurbishing or remodeling/construction activities for installing agro-processing/dairy equipment	C/B	Depending on the scale of civil works it might be Category C (refurbishing) or B (large reconstructions or new constructions)	EMP Checklist
Improving the animal heard and shelter	C/B	In the case of construction of shelters involving civil works – Category B	EMP Checklist
Purchasing of inputs and machinery for feed and fodder production	C		No further actions after filling the Environmental Screening Checklist

Depending on the nature and scale of the impacts, the CLMU ES will screen applications and assign the environmental category, informing commercial banks and the sub-project proponents about the documentation required for the subproject (filling *Annex 3* with the results of the screening). Based on the results of the screening, the proposed EA instruments would be one of the following: (a) no further EA actions is required in the case of sub-projects with environmental

category C; (b) simple Environmental Management Plan Checklists for projects with minor impacts, particularly those falling under Category B that are typical for different small scale construction and rehabilitation Investments; (c) simple EIA and EMP for Category B projects which are located in areas near natural habitats or investments in dairy processing; and (d) declining sub-project in the case of sub-project of environmental category A with significant potential impacts (to be considered as ineligible and not financed under the project). In the case of the current project such projects might be only in the case the investments are proposed to be located: (a) in or near sensitive and valuable ecosystems — wetlands, wild lands, and habitat of endangered species; (b) in or near areas with archaeological and/or historical sites or existing cultural and social institutions; (c) in densely populated areas, where resettlement may be required or potential pollution impact and other disturbances may significantly affect communities. The CLMU ES will analyze the project location and if they will be located as specified above then the project will be rejected.

In case questions regarding environmental impact or appropriate category, the CLMU ES will ask the division on Ecological Expertise of the oblast State Agency for Environmental Protection and Forestry for advice and guidance. The results of the environmental screening are recorded in the application and maintained with the CLMU and commercial banks Investment files.

Given the nature of eligible investments, most Investments are likely to fall under Category C, which, as mentioned above, no further EA actions are needed. In the case of Investments classified as Category B, the CLMU ES will review the project proposal and potential impacts and may conduct and follow-up visit to the Investment location, - this is needed especially in the cases of those proposals that may affect natural habitats, located new the protected areas or in the case that may involve the involuntary resettlement issues, identifying the main scope of the EIA to be conducted. If a site visit is necessitated, the CLMU ES will complete the field visit check list (*Annex 4*). After that the Investment applicant will hire a local consultant to conduct an EIA and prepare an EMP. The draft terms of reference for preparation of an EIA is provided in *Annex 5*. The cost of the EIA can be included in the Investment amount.

Step 3: Conducting the EIA and Preparation of site-specific Environmental Management Plan: In the cases of Category B sub-projects which needs and EIA, the project proponents and/or hired on their behalf consultants will conduct the EIA study and prepare the EMP for submission to the CLMU. Per Kyrgyz Republic legislation and WB requirements the EMP consists of the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels (*see Annex 6*). In the case when the project would involve typical different small scale construction and rehabilitation Investments for upgrading veterinary laboratory and posts, it is proposed to be used a generic EMP checklist-type format ("EMP Checklist"), developed by the World Bank to provide "pragmatic good practice" and designed to be user friendly and compatible with safeguard requirements (see it presented in the *Annex 7*). The EMP Checklist includes the environmental and social screening and mitigation measures in a simple Yes/No EMS format. In the cases of purchasing and construction of new dairy processing enterprises/equipment it would be necessary to conduct an EIA and prepare an EMP, subject to the State Ecological Expertise.

Step 4. Review and approval by the CLMU and by the SEE. If the projects are of small scale and require simple EMPs (and are not subject of State Ecological Expertise of the State Committees for Environmental Protection) then the CLMU ES will review the EA documents and approve the EMPs or simple EIAs which are subject to the SEE (*Annex 8*). This would be in most cases of small scale rehabilitation and construction activities.

In cases, when possible significant adverse impacts are discovered during the Field Site Visit or Environmental Screening and the CLMU ES decided it is necessary to conduct an EIA and prepare an EMP (as indicated in most of dairy processing sub-projects, then the applicant submits the EA documents to the CLMU ES which conducts a preliminary review of the EA document mostly in terms of their completeness and then returning them to the applicant for submitting to and obtaining approval from the SEE. As specified above, according to the national environmental legislation, projects with environmental impacts shall be subject to the SEE of the SAEPF prior to the decision-making on project implementation. The statement of opinion of the SEE can be positive or negative. Positive statement is one of the mandatory conditions of financing, lending, investments and implementation of the project submitted for expert evaluation. Positive statement of opinion of the SEE is legally effective within the period identified by the specially authorized public body on environmental expert evaluation. The legal implication of the SEE negative statement of opinion is the prohibition to implement the sub-project. In case of a negative statement of SEE, the project initiator shall have a right to provide materials for the repeated SEE on the condition of their revision with due regard for comments listed in the initial SEE statement of opinion. In order to address potential environmental impact, there is a need to apply advanced practices, preventive actions and mitigation measures identified in this document in relation to the location, design, construction and management of the project operation.

Only after the CLMU receives official approval from SEE for Investments that have adverse impacts and needs an EIA and EMP, the Investment can be considered eligible for financial support under the project and commercial banks can approve the sub-credit. As may be the case as described above, the CLMU (and/or the State Ecological Expertise in the case this is required by the national EA legislation) will specifically look for the implementation capacity and monitoring arrangements for the proposed mitigation measures and ensure that the costs of environmental management are accounted for in the project costs.

Step 5. EIA disclosure and consultation. Disclosure of the EA documents for category B projects is mandatory, and is to be done at a public place accessible to project-affected groups & local NGOs. This might be at the sub-project applicant web site/office, and local council offices. Furthermore, the sub-project applicants provide a forum or hearing for consultation and comment by project-affected groups and local non-governmental organizations during the environmental assessment process and takes their views into account before finalizing project design and submission of the project to the CLMU for final approval. The sub-borrower provides any relevant materials (process descriptions, maps, building plans, etc.) to participants in a timely manner and in a form and language that are understandable to the group being consulted and records and describes details of consultations held in the project screening form. The subprojects consultation can be done at the stage when the draft EA report is ready. In the case of new small construction, insignificant reconstruction, purchasing of agro-processing machinery and equipment, purchasing of a small quantity of cattle for production and some others which will not significantly affect the environment, public consultation can be done virtually, providing relevant information to all interested parties about these activities virtually by posting it on the web or in local public administrations. In the case of construction/reconstruction activities the project beneficiaries should also install a notice plate placed in the site of project site. Additionally all Investments specific information will be also publicly available on-line on the CLMU (MoF) and ABCC website

In case of Category B Investments which involve new constructions, or dairy processing facilities it is necessary to disclose the EIA&EMP document and to conduct public consultations with participation of key stakeholders, including local population. The purpose of the public

consultation is to inform locally affected groups about the Investment activities and offer them the opportunity to voice their views of any adverse environmental issues they feel may develop during subproject implementation. Any legitimate issue raised at the public consultation should be included in the EMP. In this way, the concerns of the people will be taken into consideration and reflected in the Investment implementation. Documentation of the public consultation outcome is critical and is included in the EMP. Such documentation should contain the (i) date and location of the consultations; (ii) list of individuals consulted; (iii) key issues raised during the consultations; and (iv) the manner in which project design address such issues raised.

Step 6: Supervision, Monitoring and Reporting: During the project implementation, the ABCC and CLMU should ensure that the environmental mitigation measures are implemented. In the case of non-compliance, the ABCC and CLMU EC as needed will investigate the nature and reason(s) for noncompliance, and a decision is taken about what is needed to bring Investment into compliance, or whether financing should be suspended.

Once project implementation starts, the ABCC and CLMU will supervise the implementation of the EMP through the course of construction and operation and specify corrective measures as necessary. The reporting of progress of implementation of the EMP would be the responsibility of the investment recipient and such reports would be submitted to the CLMU/ABCC, as relevant bi-annually. Monitoring reports during project implementation would provide information about key environmental aspects of the project activities, particularly on the environmental impacts and effectiveness of mitigation measures. Such information enables the client and the Bank to evaluate the success of mitigation as part of project supervision, and allows corrective action to be taken when needed.

Specifically, the monitoring section of the Investment EMPs would provide: (a) details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements; and, (b) monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation. The CLMU/ABCC will present short information about the EMF implementation and Investments environmental performances as part of the Progress Reports to be presented to the WB by the client on a semi-annual basis.

The status of compliance with agreed environmental mitigation measures is to be reported by the CLMU/ABCC in their regular (quarterly) reports on project implementation. In the case of non-compliance, the CLMU/ABCC investigate the nature and reason(s) for non-compliance, and a decision has to be made on what is needed to bring a sub-project into compliance, or whether financing should be suspended.

The CLMU makes available information on monitoring of environmental management plans and mitigation measures in its routine reporting on sub-project implementation to the World Bank and during periodic Bank supervision missions.

8. Integration of the ESMF into project documents

The ESMF provisions would be used for the following:

(a) Inclusion of the ESMF requirements in the Project Operational Manual;
(b) Inclusion of Environmental Guidelines in construction contracts for individual sub-projects, both into specifications and bills of quantities, and the Contractors will be required to include the cost in their financial bids;

(c) Highlighting of ESMF follow-up responsibility within the CLMU and ABCC;
(d) Specifying mitigation and avoidance measures during the implementation of the proposed activities; and
(e) Monitoring and evaluation of mitigation/avoidance measures identified in the site-specific review and in the EMPs. The necessary mitigating measures would constitute integral part of the subproject implementation including the contracts binding the contractors to carry out the environmental obligations during construction works.

All contractors will be required to use environmentally acceptable technical standards and procedures during carrying out of works. Additionally, contract clauses shall include requirements towards compliance with all national construction, health protection, safeguard procedures and rules as well as on environmental protection.

9. Institutional arrangements for ESMF implementation

Ministry of Agriculture and Melioration and the Ministry of Finance will be the Implementing Agencies for the project. The Agribusiness Competitiveness Center (ABCC) and the Credit Line Management Unit (CLMU) of the Ministry of Finance will be responsible for implementation of the technical assistance and credit line activities, respectively. CLMU has prior extensive experience in implementing Bank-financed projects and will play the major role in implementing ESMF provisions, ensuring that appropriate EIA and where necessary EMP will be prepared for each sub-project to be financed. The CLMU will be involved in the process of project implementation from the very beginning, at the project's appraisal stage. It evaluates matching grants and sub-project proposals to attribute them a WB Category and determines type of Environmental Assessment to be conducted for project, reviews the set of documents prepared by sub-borrowers (sub-projects' screening checklists as well as all necessary permits and clearances needed for project implementation) completes Environmental Screening Checklist and makes a final decision on project's financing. In case of non-compliance with presumed mitigation measures during project implementation, the CLMU can make a decision on suspending of funding.

The environmental assessment documentation for the first three Category B subprojects will be subject to prior review and approval by World Bank.

During sub-project appraisal CLMU will have to ensure that proposed sub-projects are in compliance with all environmental laws and standards of the KR, as certified by the relevant local or national authorities of the Republic, and the Environmental Guidelines. All relevant documents and permits should be kept in each sub-borrower document file maintained by the ABCC, and be made available for review by WB representatives.

Project *Environment Specialist.* The Project will hire an Environmental Specialist (ES) which will be in charge of compliance monitoring with the credit agreement regarding the EA process, including conducting the screening process. The Project ES will assist the project beneficiaries in all aspects and is responsible for reporting to both the Government and the World Bank on ESMF implementation.

The role of the Project ES will be following: (i) providing assistance to the project beneficiaries to determine the exact impacts that can be generated by proposed activities for which matching grants and sub-loans are being sought as well as prescribing in specific terms the required mitigation actions to be taken; (ii) conducting environmental screening and ensuring EA for all

matching grants and sub-projects; (iii) reviewing EA documents and approving them (those which do not require special State Ecological Expertise approval); (iv) monitoring and reporting on a regular basis the effects on the environment that financed activities may provoke and to ensure that mitigation specified in the Environmental Management Plans is appropriately carried out; (v) raising awareness on environmental issues and strengthen capacity of project stakeholders toward ensuring that potential environmental impacts could be recognized, avoided or at least minimized through mitigation. In this regard among the tasks to be performed by ES would be: design the environmental training programs on national environmental legislation, World Bank Safeguard Policies, Environmental Impact Assessment, etc.; organize preparing a reference manual which would include the list of national environmental legislation, list of economic activities requiring permits, compliance procedures and/or compliance inspections; organize delivery of training through a series of seminars to the target audience on the associated to the project environmental issues (see below).

10. Environmental Assessment capacity building activities

As specified above, the project will support of information dissemination activities and training on the following issues:

Training for the CLMU/ABCC Environmental Specialist. He/she should have training course on EA techniques and procedures. For that purpose he/she might visit a similar WB project in other countries in the region and/or to hire a consultant who might provide him/her on the job training. The training should cover the following issues: (a) national and World Bank requirements for environmental assessment; (b) screening and scoping procedures including checklists of potential environmental impacts of the proposed activities and potential agro-processing activities; (c) main provisions of environmental management plans for proposed sub projects, including mitigation and monitoring requirements. The training program should also be practical and include work with realistic case studies, based on actual loan proposals and types of business activities supported by the Project. It should also cover an explanation and practical application of the environmental standards and ESMF forms designed for use by the participating financial institutions. Field studies also may be included. Such training will enable these target groups to recognize and assess potential negative environmental impacts and set of measures to mitigate them.

ABCC and CLMU awareness raising. As the ABCC and CLMU would be trained on environmental issues of the sector as well as on EA rules and procedures. For this purpose it would be necessary at the initial stage of the project implementation to organize a half a day workshop on specified issues.

Training for the NGO responsible for group mobilization[22]. As the they also will be responsible for ensuring all sub-financing recipients will fill out the environmental screening forms

[22] This training will also be used for training of the staff of commercial banks, should a credit line be included in the project at a later stage and commercial bank(s) selected as participating financial institutions (PFIs) for provision of sub-loans. As the banks they also will be responsible for ensuring that all sub-loan borrowers fill out the environmental screening forms and for identifying potential sub projects environmental issues, but also for ensuring that all sub-projects of category B have been subject to an EA process and have associated EMPs, it is recommended that each participating bank would designate a staff which would be trained on environmental issues to designated further environmental assessment responsibility. In this regard, a special training program would be designed involving representatives from the participating banks which should be practical and include work with realistic case studies, based on actual loan proposals and types of business activities supported by the Project.

and respectively, for identifying potential sub projects environmental issues, but also for ensuring that all sub-projects of category B have been subject to an EA process and have associated EMPs, it is recommended that each participating NGO designates a staff which would be trained on environmental issues to designated further environmental assessment responsibility. The training will cover the following issues: (a) national and World Bank requirements for environmental assessment; (b) screening and scoping procedures including checklists of potential environmental impacts of the agricultural production and agro-processing activities; (c) main provisions of environmental management plans for proposed sub-projects, including mitigation and monitoring requirements.

Training for Revolving Fund sub-financing recipients (and, if necessary, sub-borrowers). Next the most critical group to be exposed to the importance of the environment concerns includes farmers and entrepreneurs from agricultural and agro-processing sectors who will be receiving the sub-financings, and whom should be provided advices on use better available techniques to prevent/ mitigate impact of the fodder production and agro-processing technologies. The workshops for this group would include environmental awareness and a practical exercise to observe and learn about sustainable and best available techniques in fodder production and dairy and agro-processing activities.

11. Budget

Requested expenses. At the project design stage, the funds to be spent for preparing grants and sub projects Environmental Impact Assessments, obtaining of necessary permits and other relevant activities are the responsibilities of grant recipients and sub-borrowers. They will depend on the nature of project proposal, its complexity, scale, etc. At the construction and operation stages, the funds to be spent for installations and other activities to ensure mitigation measures against the environmental impacts from proposed activities is also the responsibility of sub-borrowers. These funds will depend on particular techniques and technologies used for implementing mitigation measures as well as on their scale, number, variety and other factors. At the same time, in order to ensure successful ESMF implementation, a series of capacity building activities are necessary for which the project has to provide adequate funding. Estimate budget for proposed capacity building activities and trainings (specified in the point 10 above is presented in the *Table 5* below.

Table 5. Estimate budget for proposed capacity building activities

Training Required and Target Group	**Purpose**	**No of participants/ No of days for the workshop/ No of workshops**	**Total funds**
Environmental issues, aspects of EIA, environmental guidelines and EMPs for on-farm investments			
1.Environmental awareness workshop for ABCC and CLMU staff	To ensure that the staff of these bodies are aware about importance of the environment and know how to recognize the impacts that various funded activities may have on the environment.	1 workshop (half a day)	1000
2.CLMU/ABCC environment specialist	To provide CLMU ES with knowledge on the screening of the projects, EIA process and EIA review	Study tour	2500 USD
3. Sub borrowers/project beneficiaries (one for	Environmental awareness and a practical exercise to observe and learn about sustainable	5X1days trainings	5000 USD

farmers and one for dairy processing enterprises)	pasture management and best available techniques in dairy and agro-processing		
4.NGOs responsible for group mobilization (and, if necessary, Commercial Banks and their loan officers)	Training on use of environmental guideline how to identify sub projects that may fall into one of the Bank's environmental categories, and in which case will require a full and/or a partial EIA, and, to identify activities that may affect the environment and in organizing the subprojects EIAs and in filling the environmental screening checklists	1x1 days training	3000 USD
Integrated Pest Management in fodder production and safe use of acaricides			
Trainings			
5. Representatives of oblast and district agricultural departments; participating farmers (Sub-financing recipients from the Revolving Fund/project beneficiaries/Sub-borrowers (as necessary))	Pest characteristics applied for fodder production; control measures, including IPM approaches, involving agricultural, physical, biological, and chemical control methods	1X2 day workshop	5000 USD
6. Representatives of oblast and district agricultural departments; participating farmers, Local environmental inspectors (Sub-financing recipients from the Revolving Fund/project beneficiaries/Sub-borrowers (as necessary))	Safety issues (for pest handling, transportation, usage and storage)	5X1 day workshop	5000 USD
7. Representatives of oblast and rayon agricultural departments; participating farmers, Local environmental inspectors (Sub-financing recipients from the Revolving Fund/project beneficiaries/Sub-borrowers (as necessary))	Safety issues and sustainable use of acaricides in livestock practices	5X1 day workshop	5000 $
Ensuring bio-safety and waste management and preventing inadvertent spread of the animal diseases			
Representatives of regional veterinary laboratory	Laboratory waste management by basing training and upgrades to laboratory infrastructure and equipment on "International Best Practice in Safety of Research Laboratories" developed by the US National Institutes of Health; use of PPE; Safe disposal of waste and contaminated materials; Treatment of hazard waste in accordance with regulations and administrative instructions and etc.	1x2 day training	3000
Field demonstrations with improved pesticides usage and IPM technologies, silage preparation			
8. Representatives of oblast and rayon agricultural departments;	Field demonstrations on Pest problems diagnosed and related IPM opportunities in fodder production, pest management practices,	1X1 day workshop	5000 USD

participating farmers (Sub-financing recipients from the Revolving Fund/project beneficiaries/Sub-borrowers (as necessary))	including agricultural, physical, biological and chemical control methods		
Representatives of oblast and rayon agricultural departments; participating farmers (Sub-financing recipients from the Revolving Fund/project beneficiaries/Sub-borrowers (as necessary))	Field demonstrations on proper Silage preparation and pollution prevention measures	5X1 day workshop	6000 USD
Public awareness related to livestock environmental issues			
Training			
Representatives of oblast and rayon agricultural departments; participating farmers (Sub-financing recipients from the Revolving Fund/project beneficiaries/Sub-borrowers (as necessary)); Environmental inspectors	Managing sector environmental and social impacts in the livestock sector, including disposal of dead animal carcasses	5X1 day workshop	5000 USD
Representatives of oblast and rayon agricultural departments; participating farmers (Sub-financing recipients from the Revolving Fund/project beneficiaries/Sub-borrowers (as necessary)) Environmental inspectors	Silage production and proper environmental management	1x1 day workshop	1000 USD
Representatives of oblast and rayon agricultural departments; participating farmers (Sub-financing recipients from the Revolving Fund/project beneficiaries/Sub-borrowers (as necessary)); Environmental inspectors	Sustainable manure management, responsibilities, manure management plans	5x1 day workshop	5000 USD
Representatives from private sector dairy processing enterprises;	Sustainable management of dairy-processing related environmental problems, manure management, responsibilities to prevent effects	3x1 day workshop	5000 USD

Environmental inspectors	of pollution, good minimization practices (examples[23]) and etc.		
Preparing and disseminating information materials			
Preparing, printing and disseminating different guidebooks	a. Silage production; b. Manure management c. IMP and agro-chemicals use. d. Use of acaricides e. Environmental problems in the veterinary sector f. Dairy processing and environmental problems		25000 USD
TOTAL			**USD 86,500**

12. Environmental Management Framework's Disclosure and Consultation

ESMF Disclosure. The CLMU (MoF)/ABCC on February 10 and 16, 2016, has disseminated the draft summary ESMF in Russian and Kyrgyz language in its institutions and to other relevant ministries for review and comments, also posting it for wide public on the web-page of the MoF (http://www.minfin.kg/ru/novosti/novosti/ramochnyy-dokument-po-ekologicheskomu-i-sotsialnom.html) and disseminated through local electronic networks ABCC web-site (http://www.agromarket.kg/index.php?option=com_content&view=article&id=835:2016-02-10-05-27-52&catid=9&Itemid=105). CAREC also posted information on public consultations and ESMF document on its web-site (www.carececo.org (http://www.carececo.org/news/v-filiale-retstsa-kyrgyzstan-sostoyalas-vstrecha-s-konsultantom-vsemirnogo-banka-po-proektu-programm/).

ESMF Public consultation. On February 26, 2016, the CLMU/ABCC has conducted a public briefing and consultation on this document (see *Annex 9* with the minutes of consultation). Outside of participants from the interested state institutions in the meeting took part also representatives from environmental and agricultural NGOs, local representatives of the government bodies, such as SAEPF, MoA,, MoF, local authorities of Issyk-Kul oblast, and others. During the consultation, the CLMU/ABCC has presented a summary of a draft ESMF to public. Particularly, the audience was informed about screening of the projects, types of Environmental Assessment for Category B projects, potential impacts which may by generated by small scale rehabilitation and construction, fodder production and agro-processing activities as well as measures to be taken to prevent/mitigate potential impacts. The consultation meeting's attendees actively participated in discussions which were mainly focused on environmental screening procedure, implementing arrangements, rules and procedures for agro chemicals use and capacity of environmental authorities to perform monitoring of sub-projects.

The meeting concluded that the draft ESMF document covered practically all potential impacts and possible mitigation measures. The draft ESMF was revised after the meeting taking into account inputs from the consultation. The final version of the EMF was disclosed in the country and in the WB Infoshop and will be used by the government agencies during the project implementation.

[23] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/268691/pb13558-cogap-131223.pdf

Annex 1. *International Best Practice in Safety of Research Laboratories*[24]

Procurement / Transport
• Minimize acquisition / quantity of hazardous materials, minimize storage time needed • Identify mechanism of waste disposal before acquisition • For chemicals, have Material Safety Data Sheets (MSDSs) accessible/confine deliveries to areas that are equipped to handle them (and train relevant personnel) • Ensure container is intact and appropriately labeled (US regulations detail how hazardous materials have to be identified, packaged, marked, labeled, documented and placarded) • Transport in appropriate (secondary) containers • Use triple packaging system for infectious and potentially infectious substances • Adhere to international air transport regulations
Storage / Management
• Inventory should have name as printed on the container • For chemicals: include molecular formula for further identification and to provide a simple means of searching chemicals; include CAS (Chemical Abstract Service) registry number for unambiguous identification of chemicals despite the use of different naming conventions • Source • Size of container • Hazard classification, as a guide to safe storage, handling, and disposal • Date of acquisition, to ensure that unstable chemicals are not stored beyond their useful life, and Storage location *Procedures* • Dispose of materials anticipated to not be needed within a reasonable time frame • Use approved containers; make sure storage containers remain intact and sealed • Dispose of chemicals prior to expiration date, monitor reactive chemicals • Replace deteriorating labels before information is obscured or lost • Follow regulations for safe storage in stockroom or lab • Avoid storing chemicals on bench tops or lab hoods • Store volatile chemicals in ventilated cabinet (near hood) • If ventilation is not required, store in closable cabinet or on shelf with lip to prevent sliding • Do not expose stored chemicals to heat or direct sunlight • Observe all precautions regarding the storage of incompatible chemicals • Provide vented cabinets beneath hoods for storing hazardous materials • Use chemical storage refrigerators for storing chemicals • Have fire protection system (sprinklers) • Follow storage limits for flammable and combustible liquids • Restrict access to storage facility
Protocols / Facilities for Use in Research
• Wear and use appropriate personal protection materials to minimize exposure • Wash hands • Reduce the possibility of creating splashes or aerosols • Contain in biological safety cabinets operations that generate aerosols • Use good housekeeping • Use mechanical pipetting devices • Promptly decontaminate work surfaces • Never eat, ring, smoke, handle contact lenses, apply cosmetics, or take medicine in the lab • Take special care when using sharps • Keep lab doors closed when experiments are in progress

[24] US National Institutes of Health

• Use secondary leak-proof containers to move or transfer cultures • Decontaminate infectious waste before disposal • Post appropriate warning signs • Mark emergency equipment, maintain it, inspect it; list telephone numbers to call in case of accident • Control access *For Radioisotopes* • Use only in designated areas • Allow the presence of essential staff only • Use personal protective equipment • Monitor personal radiation exposures • Use spill trays lined with disposable absorbent materials • Limit radionuclide quantities • Shield radiation sources • Mark radiation containers with the radiation symbol, including radionuclide identity, activity, and assay date • Use radiation meters to monitor working areas, protective clothing, and hands after completion of work • Use appropriately shielded transport containers • Remove radioactive waste frequently from the working area • Maintain accurate records of use and disposal of radioactive materials • Screen dosimetry records for materials exceeding the dose limits • Establish and regularly exercise emergency response plans • In emergencies, assist injured persons first • Clean contaminated areas thoroughly • Write and keep incident reports *For Animal laboratories* • Require good microbiological techniques • Establish policies and protocols for all operations and for access to vivarium • Establish appropriate medical surveillance program and supervision for staff • Prepare and adopt safety or operations manual • Post warning signs • Decontaminate work surfaces after use • Use appropriate biological safety cabinets or isolator cages; handle and decontaminate animal bedding and waste materials appropriately • Transport material for autoclaving or incineration safely, in closed containers • Treat, report, and record injuries
Training of Personnel
Employer develops Chemical Hygiene Plan containing (models available from U.S. government and from some professional societies) • Employee information and training about the hazards of chemicals in the work area: How to detect their presence or release Work practices and how to use protective equipment Emergency response procedures • Circumstances under which a lab operation requires prior approval from the institution • Standard operating procedures for work with hazardous chemicals • Criteria for use of control measures • Measures to ensure proper operation of fume hoods and other protective equipment • Provisions for additional employee protection for work with select carcinogens and toxins • Provisions for medical consultations and examinations for employees • Labs should establish their own safety groups at the department level (include students and support staff) • Labs should provide training in safety and waste management for all lab workers, including students in laboratory classes • Labs should incorporate institutionally supported lab and equipment inspection programs into their overall health

and safety programs

- Review exit / evacuation routes
- Know how to report fire, injury, chemical spill, or summon emergency response
- Know first aid
- Know location and use of emergency equipment such as safety showers and eyewashes
- Know location and use of fire extinguishers and spill control equipment (have appropriate kits readily available)
- Lab personnel should establish ongoing relationships and clear lines of communication with emergency response teams
- Include information on safe methods for highly hazardous procedures commonly encountered by lab personnel that involve:

Inhalation risks
Ingestion risks
Risks of percutaneous exposures
Bites and scratches when handling animals
Handling of blood and other potentially hazardous pathological materials
Decontamination and disposal of infectious material

Segregation / Triage of Waste

Multi hazardous waste – goal is reduction of waste to a waste that presents a single hazard.

- Consider frequency and amount of waste generated; assess risk
- Identify / characterize waste:

Physical description
Water reactivity
Water solubility
pH and possibly neutralization information
ignitability / flammability
presence of oxidizer
presence of sulfides / cyanides
presence of halogens
presence of radioactive materials
presence of biohazardous materials
presence of toxic constituents

- Minimize waste's hazards
- Determine options for management of hazards
- If appropriate, take steps to neutralize waste or render it non-hazardous
- When possible, select a single management option
- Establish procedures for dealing with unstable waste, or waste that requires special storage or handling
- Store safely:

Designated room or facility modified to contain the waste (with ventilation and effluent trapping)
Protect workers
Minimize risk of fire or spill
Minimize radiation levels outside of area
Consider compatibility of materials being accumulated (e.g., aqueous and non-aqueous waste should be separated)

- Give particular attention to the handling or cleaning of radioactive laboratory ware, and to the proper disposal of sharps.

Non-contaminated (non-infectious) waste can be reused or recycled or disposed of as general waste
Contaminated (infectious) sharps – collect in puncture-proof containers fitted with covers and treated as infectious; autoclave if appropriate
Contaminated material for decontamination by autoclaving and thereafter washing and reuse or recycling
Contaminated material for direct incineration

Disposal

No activity should begin unless a plan for the disposal of hazardous waste has been formulated

- Use appropriate disposal method for each category of waste

- Use appropriate containers
- Label and securely close waste containers
- Separate wastes as appropriate

For low level radioactive waste, options include

- Storage time for decay and indefinite on site storage,
- Burial at a low-level radioactive waste site,
- Incineration, or
- Sanitary sewer disposal

For biological waste, options include

- Disinfection
- Autoclaving
- For liquids, disposal in sanitary sewer; putrescible waste disposed of by incineration; needles and sharps require destruction, typically by incineration or grinding

Collection and storage of waste

- At satellite area near lab:

should be clearly identified, ventilated if necessary
determine whether to recycle, reuse, or dispose
hold here for less than one year; when containment volume limits reached, move to central accumulation area – package appropriately

- At central accumulation area:

separate according to compatibility, commingle solvents when appropriate
label clearly, store in appropriate containers
limit storage time to 90 days
(ensure that employees are trained to handle waste materials as well as contingency planning for emergencies)
When transporting, make provisions for spill control in case of accident; have internal tracking system to follow movement of waste
Ensure that all necessary records have been generated (Quantities and identification of waste generated and shipped; Documentation and analyses of unknown materials; Manifests for waste shipping as well as verification of waste disposal; Any other information required to ensure compliance and safety from long-term liability)

- Disposal options:

Incineration – is method of choice for most wastes, but is most expensive
Normal trash – only where appropriate, must be clearly identified and appropriately labeled
Sanitary sewer – not commonly used; solutions must be aqueous and biodegradable, or low toxicity inorganics – make sure sewer doesn't drain into water supply inappropriate for waste disposal, and make sure waste is highly diluted
Release to the atmosphere – not acceptable; fume hoods must have trapping devices to prevent discharge to atmosphere

- If hazardous and non-hazardous wastes are mixed, entire waste volume must be treated as hazardous
- Preparation for transport to a treatment, storage, and disposal facility (TSDF)
- Waste generator must obtain assurance (in terms of documentation, permits, records) that provider is reliable

For infectious material

- Decontaminate, autoclave, or incinerate in lab
- Package appropriately (for incineration or for transfer to another facility for incineration)
- Protect against hazards to others to those who might come in contact with discarded items

Annex 2. ***INITIAL ENVIRONMENTAL SCREENING CHECKLIST***

(to be completed by Sub-borrower; Groups of Revolving Fund sub-financing recipients will provide a one-paragraph summary of the environmental and social aspects of the group's activities, with help from the project's Environmental Specialist and the NGO)

1. **Project title:**

2. **Brief Description of Sub-project** to include: nature of the project, project cost, physical size, site area, location, property ownership, existence of on-going operations, plans for expansion or new construction.

3. **Will the project have impacts on the environmental parameters** listed below during the construction or operational phases? Indicate, with a check, during which phase impacts will occur and whether mitigation measures are required.

Environmental Component/issues	Construction Phase	Operational Phase
Soil Erosion: does the project involves forage crop/cutting for hey collection/or use of fertilizers/pesticides for improving fodder production/ or improvement of animal heard and shelter? Is agricultural field is located on the slopes and/or on the plain areas?		
Habitats and Biodiversity Loss: Will the project involve use or modification of natural habitats (pasturing on and ploughing up the steppe areas, cutting or removal of trees or other natural vegetation, etc.)		
Soil pollution: Will the project applies pesticides/fertilizers/manure/silage preparation/purchase of chemicals for dairy agro-processing/purchase of inputs and machinery (for feed and fodder production)/ agro-processing and milk collection and cooling equipment and associated small scale construction and rehabilitation activities? If yes which types and their amount?		
Land, habitats & ecosystems degradation: Is the area which is to be used currently a natural (not converted) habitat (forest, wetland, natural grassland, etc.)?		
Land degradation: Will the project involve land excavation?		
Generation of solid wastes – what type of wastes will be generated (various types of construction wastes, wastes from agro-processing activities, livestock manure) and their approximate amount		
Generation of toxic wastes – what types of toxic waste will be generated (obsolete and unusable pesticides and mineral fertilizers; chemicals used in agro-processing activities; asbestos and etc.) and their approximate amount.		
Biodiversity and Habitats Loss: Will the project located in vicinity of protected areas or other sensitive areas supporting important habitats of natural fauna and flora? Is it planned enlargement of area under agricultural crop production based on transformation of natural habitats?		
Underground water pollution - if the project involves production of stall fed livestock does it has a manure platform? If the project will involve silage production sites does it include relevant protection		

facilities?		
Construction		
Air quality		
Will the project provide pollutant emissions? Which types of pollutants (SOx, NOx, solid particles, dioxins, furans, etc.)		
Water Quantity: will the project involve water use? Which volumes and from which water source (centralized water supply system and/or from water reservoir)?		
Water Quality/Pollution: Will the project contribute to surface water pollution – what will be the approximate volumes of waste water discharge? Does the project involve discharges of waste waters in water reservoirs and/or in centralized sanitation network/septic tank?		
Loss of Biodiversity: Will the project involve introduction of alien species (in case of aquaculture projects)?		
Loss of Biodiversity: Will the project located in vicinity of protected area or wetlands?		
Degradation of natural aquatic ecosystems – if the project involves discharges in water courses and reservoirs of solid wastes; pesticides/fertilizers/ manure effluents/silage leachates/; cutting of protective shelterbelts.		
Weeds, pests, diseases: will the project contribute to spreading of weeds, pests and animal and plant diseases?		
Sedimentation of water bodies – will the project contribute to sedimentation of water bodies due to soil erosion ?		
Social impacts – does the project involve the following: (a) occupational safety issues; (b) health hazards; (c) involuntary land acquisition or displacement of third parties using land; (d) loss of access to sources of income; (e) loss of physical and/or economic assets; and (f) disturbance of residents living near the project area.		
Does the project per national legislation require public consultation to consider local people environmental concerns and inputs?		
Will the project assure non-deterioration of human health, occupational safety and non-disturbance of residents living near project area? If no, is it possible by applying proposed mitigation measures to reduce the project environmental and social impacts to admissible levels?		

Annex 3. ***ENVIRONMENTAL SCREENING RESULTS CHECKLIST***

(to be completed by ABCC Environmental Specialist)

1. Project Name:

2. Will the project have environmental and social impacts? What are the most important impacts? Are they significant?

3. Project Environmental Category (B or C) _____

4. Environmental Assessment required (yes or no) _____

5. Type of Environmental Assessment (for Category B projects - partial EIA and/or EMP checklist)
_____

6. Types of EA documents (partial EIA, including site assessment and Environmental Management Plan for category B projects; Site Assessment and EMP checklists for small scale category B projects)

Environmental Screener: **Date:**

Annex 4. ***FIELD SITE VISIT CHECKLIST***

Project Name: **Date/time of Visit:**

Location of project site: **Visitors:**

Current activity and site history

- Who is the site contact (name, position, contact information)?
- What is the area of the site to be used for project activities?
- What are current uses of the site? Are there any structures on the site?
- What were previous uses of the site (give dates if possible)?

Environmental Situation

- Are there sensitive sites nearby (nature reserves, cultural sites, and historical landmarks)?
- Are there water courses on the site?
- What is the terrain or slope?
- Does the site experience flooding, water logging or landslides? Are there signs of erosion?
- What are the neighbouring buildings (e.g. schools, dwellings, industries) and land uses? Estimate distances.
- Will the proposed site affect transportation or public utilities?

Licenses, Permits and Clearances

- Does the site require licenses or permits to operate the type of activity proposed? Are these available for inspection?
- What environmental or other (e.g., health, forestry) authorities have jurisdiction over the site?

Water Quality Issues

- Does the proposed activity use water for any purposes (give details and estimate quantity). What is the source?
- Will the proposed activity produce any effluent? (estimate quantity and identify discharge point)
- Is there a drainage system on site for surface waters or sewage? Is there a plan available of existing drainage or septic systems?
- How waste water is managed (surface water courses, dry wells, septic tanks)?

Soils

- What is the ground surface (agricultural land, pasture, etc.)?
- Will the project damage soils during construction or operations?
- Will the project affect the landscape significantly (draining wetlands, changing stream courses)

Biological environment

- Describe vegetation cover on the site.
- Is there information about rare or threatened flora and fauna at or near the site? If yes, would the project have an impact or increase risk to the species?
- Obtain a list of vertebrate fauna and common plants of the site (if available).
- Note potential negative impacts on biota if project proceeds.

Visual Inspection Procedures

- Try to obtain a site map or make a sketch to mark details.
- Take photos, if permitted.
- Walk over as much of the site as possible, including boundaries, to note adjacent activities.
- Note any odours, smoke or visual dust emissions, standing water, etc.
- Note any signs of recent destruction of crops or physical structures.
- Confirm that there has been no loss of physical and/or economic assets, that no informal land users have been displaced in preparation for the project. This can be done through visual inspection, discussions with the project proponent and nearby individuals, as necessary.

Annex 5. ***Sample of the TORs for the sub-project EIA***

An ***Environmental Impact Assessment (EIA)*** report Categories A and B sub-projects focuses on the significant environmental issues raised by a sub-project. Its primary purpose is to identify environmental impacts and those measures that, if incorporated into the design and implementation of a project can assure that the negative environmental effects will be minimized. The scope and level of detail required in the analysis depend on the magnitude and severity of potential impacts.

The Environmental Impact Assessment Report should include the following elements:

a. *Executive Summary*. This summarizes the significant findings and recommended actions.
b. *Policy, legal and administrative framework*. This section summarizes the legal and regulatory framework that applies to environmental management in the jurisdiction where the study is done.
c. *Project Description*. Describes the nature and scope of the project and the geographic, ecological, temporal and socioeconomic context in which the project will be carried out. The description should identify social groups that will be affected, include a map of the project site, and identify any off-site or support facilities that will be required for the project.
d. *Baseline data*. Describe relevant physical, biological and social condition including any significant changes anticipated before the project begins. Data should be relevant to project design, location, operation or mitigation measures.
e. *Environmental impacts*. Describe the likely or expected positive and negative impacts in quantitative terms to the extent possible. Identify mitigation measures and estimate residual impacts after mitigation. Describe the limits of available data and uncertainties related to the estimation of impacts and the results of proposed mitigation.
f. *Analysis of Alternatives*. Systematically compare feasible alternatives to the proposed project location, design and operation including the "without project" alternative in terms of their relative impacts, costs and suitability to local conditions. For each of the alternatives quantify and compare the environmental impacts and costs relative to the proposed plan.
g. *Environmental Management Plan (EMP).* If significant impacts requiring mitigation are identified, the EMP defines the mitigation that will be done, identifies key monitoring indicators and any needs for institutional strengthening for effective mitigation and monitoring to be carried out.
h. *Appendices.*

This section should include:

i. The list of EIA preparers;
ii. References used in study preparation;
iii. A chronological record of interagency meetings and consultations with NGOs and effected constituents;
iv. Tables reporting relevant data discussed in the main text, and;
v. A list of associated reports such as resettlement plans or social assessments that were prepared for the project.

Annex 6: ***Environmental Management Plan Content***

General Remarks. An Environmental Management Plan (EMP) should outline the mitigation, monitoring and administrative measures to be taken during project implementation to avoid or eliminate negative environmental impacts.

The Environmental Management Plan format provided in *Table X. below.* It represents a model for development of an EMP. The model divides the project cycle into three phases: construction, operation and decommissioning. For each phase, the preparation team identifies any significant environmental impacts that are anticipated based on the analysis done in the context of preparing an environmental assessment. For each impact, mitigation measures are to be identified and listed. Estimates are made of the cost of mitigation actions broken down by estimates for installation (investment cost) and operation (recurrent cost). The EMP format also provides for the identification of institutional responsibilities for "installation" and operation of mitigation devices and methods.

To keep track of the requirements, responsibilities and costs for monitoring the implementation of environmental mitigation identified in the analysis included in an environmental assessment a monitoring plan is necessary.

A *Monitoring Plan format* is provided in below in the table X and includes a row for baseline information that is critical to achieving reliable and credible monitoring. The key elements of the matrix are:

- What is being monitored?
- Where is monitoring done?
- How is the parameter to be monitored to ensure meaningful comparisons?
- When or how frequently is monitoring necessary or most effective?
- Why is the parameter being monitored (what does it tell us about environmental impact)?

In addition to these questions, it is necessary to identify the costs associated with monitoring (both investment and recurrent) and the institutional responsibilities.

When a monitoring plan is developed and put in place in the context of project implementation, the PIU will request reports at appropriate intervals and include the findings in its periodic reporting to the World Bank and make the findings available to Bank staff during supervision missions.

The Environmental Management Plan (EMP) identifies feasible and cost-effective measures that may reduce potentially significant adverse environmental impacts to acceptable levels. The plan includes compensatory measures if mitigation measures are not feasible, cost-effective, or sufficient. Specifically, the EMP (a) identifies and summarizes all anticipated significant adverse environmental impacts (including those involving indigenous people or involuntary resettlement); (b) describes--with technical details--each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; (c) estimates any potential environmental impacts of these measures; and (d) provides linkage with any other mitigation plans (e.g., for involuntary resettlement, indigenous peoples, or cultural property) required for the project.

Monitoring. Environmental monitoring during project implementation provides information about key environmental aspects of the project, particularly the environmental impacts of the project and the effectiveness of mitigation measures. Such information enables the borrower and the Bank to evaluate the success of mitigation as part of project supervision, and allows corrective action to be taken when needed. Therefore, the EMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the EA report and the mitigation

measures described in the EMP. Specifically, the monitoring section of the EMP provides(a) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and (b) monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

Capacity Development and Training. To support timely and effective implementation of environmental project components and mitigation measures, the EMP draws on the EA's assessment of the existence, role, and capability of environmental units on site or at the agency and ministry level.[3] If necessary, the EMP recommends the establishment or expansion of such units, and the training of staff, to allow implementation of EA recommendations. Specifically, the EMP provides a specific description of institutional arrangements - who is responsible for carrying out the mitigation and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training). To strengthen environmental management capability in the agencies responsible for implementation, most EMPs cover one or more of the following additional topics: (a) technical assistance programs, (b) procurement of equipment and supplies, and (c) organizational changes.

Implementation Schedule and Cost Estimates. For all three aspects (mitigation, monitoring, and capacity development), the EMP provides (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the EMP. These figures are also integrated into the total project cost tables.

Integration of EMP with Project. The borrower's decision to proceed with a project, and the Bank's decision to support it, is predicated in part on the expectation that the EMP will be executed effectively. Consequently, the Bank expects the plan to be specific in its description of the individual mitigation and monitoring measures and its assignment of institutional responsibilities, and it must be integrated into the project's overall planning, design, budget, and implementation. Such integration is achieved by establishing the EMP within the project so that the plan will receive funding and supervision along with the other components.

Table 1. Environmental Management Plan Format

Phase	Environmental Impact	Mitigating Measure(s)	Cost	Institutional Responsibility	Remarks
Construction					
Operation					
Decommissioning					

Table 2. Environmental Monitoring Plan format

PHASE	WHAT is the parameter to be monitored?	WHERE is the parameter to be monitored?	HOW is the parameter to be monitored??	WHEN is the parameter to be monitored? (frequency)?	WHY is the parameter being monitored?	COST	RESPONSIBILITY
Designing							
Construction							
Operation							

Annex 7. ***Environmental Management Plan Checklist for Small Scale Construction and Rehabilitation Activities***

Part 1. Project Information

INSTITUTIONAL & ADMINISTRATIVE ARRANGEMENTS				
Country	Kyrgyz Republic			
Integrated Dairy productivity	Integrated Dairy Productivity Improvement Project			
Scope of project and activity				
Institutional arrangements (names and contacts)	WB (Project Team Leader(s)) **Sandra Broka Mai Nguyen Serhiy Osavolyuk)**	Project Management **CLMU/ABCC**	Local Counterpart and/or Recipient Private small-scale beneficiaries (small shops for inputs, provate veterinary offices, provate AI offices, etc.)	
Implementation arrangements (Name and contacts)	Safeguard Supervision **Director Ermek Uruzbaev (0557881607)**	Local Counterpart Supervision	Local Inspectorate Supervision	Contactor
SITE DESCRIPTION				
Name of site	**Issuk-kul region**			
Describe site location	**Multiple**		*Attachment 1*: Site Map [ ]Y / [ ]N	
Who owns the land?	**Private**			
Geographic description	TBD Climate type: sharp continental			
LEGISLATION				
Identify national & local legislation & permits that apply to project activity	Law on Environmental Protection; Law on Ecological Expertise.			
PUBLIC CONSULTATION				
Identify when / where the public consultation process took place	26th February 2015, conference-hall of Akimiyat building in Karakol city			
INSTITUTIONAL CAPACITY BUILDING				
Will there be any capacity building? (Yes/No)	[Yes], if Yes, *Attachment 2* includes the capacity building program			

Beneficiary: ***Signature:*** ***Date:***

Environmental Management Plan Checklist Template for Small Scale Construction and Rehabilitation Activities

Part 2. Safeguards Information

ENVIRONMENTAL /SOCIAL SCREENING			
Will the site activity include/involve any of the following:	**Activity**	**Status**	**Additional references**
	Building rehabilitation	[ ] Yes [x] No	See Section **B** below
	New construction	[x] Yes [ ] No	See Section **B** below
	Individual wastewater treatment system	[x] Yes [ ] No	See Section **C** below
	Historic building(s) and districts	[x] Yes [] No	See Section **D** below
	Acquisition of land[25]	[ ] Yes [x] No	See Section **E** below
	Hazardous or toxic materials[26]	[x] Yes [ ] No	See Section **F** below
	Impacts on forests and/or protected areas	[ ] Yes [x] No	See Section **G** below
	Handling / management of medical waste	[x] Yes [] No	See Section **H** below
	Traffic and Pedestrian Safety	[x] Yes [ ] No	See Section **I** below

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
A. General Conditions	Notification and Worker Safety	The local construction and environment inspectorates and communities have been notified of upcoming activities The public has been notified of the works through appropriate notification in the media and/or at publicly accessible sites (including the site of the works) All legally required permits have been acquired for construction and/or rehabilitation All work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment. Workers will comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses and safety boots) Appropriate signposting of the sites will inform workers of key rules and regulations to follow.
B. General Rehabilitation and /or Construction Activities	Air Quality	During interior demolition use debris-chutes above the first floor Keep demolition debris in controlled area and spray with water mist to reduce debris dust Suppress dust during pneumatic drilling/wall destruction by ongoing water spraying and/or installing dust screen enclosures at site Keep surrounding environment (side-walks, roads) free of debris to minimize dust There will be no open burning of construction / waste material at the site There will be no excessive idling of construction vehicles at sites

[25] The project will support construction of new buildings only in the case when land acquisition is not necessary and there are no any resettlement issues; for such cases the investor should have the landownership title as well as has to prove the land at the moment of sub-projects application is not occupied or used even illegally

[26] Toxic / hazardous material includes and is not limited to asbestos, toxic paints, removal of lead paint, etc.

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
	Noise	Construction noise will be limited to restricted times agreed to in the permit During operations the engine covers of generators, air compressors and other powered mechanical equipment should be closed, and equipment placed as far away from residential areas as possible
	Water Quality	The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in nearby streams and rivers.
	Waste management	Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities. Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers. Construction waste will be collected and disposed properly by licensed collectors The records of waste disposal will be maintained as proof for proper management as designed. Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos)
C. Individual wastewater treatment system	Water Quality	The approach to handling sanitary wastes and wastewater from building sites (installation or reconstruction) must be approved by the local authorities Before being discharged into receiving waters, effluents from individual wastewater systems must be treated in order to meet the minimal quality criteria set out by national guidelines on effluent quality and wastewater treatment Monitoring of new wastewater systems (before/after) will be carried out
D. Historic building(s)	Cultural Heritage	If the building is a designated historic structure, very close to such a structure, or located in a designated historic district, notify and obtain approval/permits from local authorities and address all construction activities in line with local and national legislation Ensure that provisions are put in place so that artifacts or other possible "chance finds" encountered in excavation or construction are noted, officials contacted, and works activities delayed or modified to account for such finds.
E. Acquisition of land	Land Acquisition Plan/Framework	If expropriation of land was not expected and is required, or if loss of access to income or damage to assets of legal or illegal users of land was not expected but may occur, that the bank Task Team Leader is consulted. The approved by the Bank Land Acquisition Plan (if required by the project) will be implemented prior to start of project works.
F. Toxic Materials	Asbestos management	If asbestos is located on the project site, mark clearly as hazardous material When possible the asbestos will be appropriately contained and sealed to minimize exposure The asbestos prior to removal (if removal is necessary) will be treated with a wetting agent to minimize asbestos dust

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
		Asbestos will be handled and disposed by skilled & experienced professionals If asbestos material is be stored temporarily, the wastes should be securely enclosed inside closed containments and marked appropriately The removed asbestos will not be reused
	Toxic / hazardous waste management	Temporarily storage on site of all hazardous or toxic substances will be in safe containers labeled with details of composition, properties and handling information The containers of hazardous substances should be placed in an leak-proof container to prevent spillage and leaching The wastes are transported by specially licensed carriers and disposed in a licensed facility. Paints with toxic ingredients or solvents or lead-based paints will not be used
G. Affects forests and/or protected areas	Protection	All recognized natural habitats and protected areas in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities. For large trees in the vicinity of the activity, mark and cordon off with a fence large tress and protect root system and avoid any damage to the trees Adjacent wetlands and streams will be protected, from construction site run-off, with appropriate erosion and sediment control feature to include by not limited to hay bales, silt fences There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in protected areas.
H. Disposal of medical waste	Infrastructure for medical waste management	In compliance with national regulations the contractor will insure that newly constructed and/or rehabilitated health care facilities include sufficient infrastructure for medical waste handling and disposal; this includes and not limited to: Special facilities for segregated healthcare waste (including soiled instruments "sharps", and human tissue or fluids) from other waste disposal; and Appropriate storage facilities for medical waste are in place; and If the activity includes facility-based treatment, appropriate disposal options are in place and operational
I Traffic and Pedestrian Safety	Direct or indirect hazards to public traffic and pedestrians by construction activities	In compliance with national regulations the contractor will insure that the construction site is properly secured and construction related traffic regulated. This includes but is not limited to Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes. Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement Active traffic management by trained and visible staff at the site, if required for safe

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
		and convenient passage for the public. Ensuring safe and continuous access to office facilities, shops and residences during renovation activities, if the buildings stay open for the public.

Environmental Management Plan Checklist Template for Small Scale Construction and Rehabilitation Activities

Part 3. Example of an Environmental Monitoring Plan for small scale construction

PHASE	WHAT is the parameter to be monitored?	WHERE is the parameter to be monitored?	HOW is the parameter to be monitored??	WHEN is the parameter to be monitored? (frequency)?	WHY is the parameter being monitored?	COST	RESPONSIBILITY
Designing	Implementation of EMP guidelines (RECOMMENDATIONS)	Design project for construction, reconstruction and adaptation.	Review of elaborates and adaptation designs.	Prior approval for construction as part of project monitoring program.	Recommended due to national legislation requiring a construction permit.	Should be part of the Project	MERP Designer, Contractor
Construction	Parameters given in construction permit - all special conditions of construction issued by different bodies	Main Project documentation	A part of regular inspection by the SAEPF and the Construction Inspection	During construction and prior to issuance of the Operation permit	Regular review stipulated in the Law, and if any public complaint is sent to the Ministry of Environment, or the Construction Inspection.	Included in the construction phase, costs of Contractors	Supervision Engineer, inspectorate of the MERP and Construction Inspection
	Construction waste management (including hazardous)	Supporting documents for waste, which is submitted to the competent communal enterprise	A part of regular inspection by the SAEPF, Construction Inspection	After reporting on waste management	Needed in accordance with the waste-related regulations	Expenditure of the Ministry of Environment and the Construction Inspection and low costs for the Contractor	Supervision Engineer, inspectorate of the MERP and Construction Inspection
Operation	Waste management	Based on the supporting documents for waste, which is submitted to the Ministry of Environment	Reports to the SAEPF	After reporting to the Ministry of Environment on waste management.	Should be monitored in line with the regulations on waste management.	Costs of the project beneficiary and the Ministry of Environment	Project beneficiary, competent communal company and the MERP

Annex 8. ***Environmental Assessment Checklist***

(to be completed by ABCC Environmental Specialist in consultation with the Ecological Expertise, if needed)

1. Was an Environmental Assessment needed? (Y or N) ___ If yes, was it done? ___

2. Was an Environmental Management Plan prepared? (Y or N) _____

3. Are the mitigation measures to be included in project implementation adequate and appropriate? (Y or N) _____

4. Will the project comply with existing pollution control standards for emissions and wastes? (Y or N) _____ If no, will an exemption be sought? _____ _____

5. Is an Environmental Monitoring Plan necessary? (Y or N) ___ If so, has it been prepared? (Y or N) __Approved by the PFIs? _____

6. What follow-up actions are required by the proponent, the PFIs or the PIU Environmental Specialist?

_____

_____

_____

7. Were public consultations held concerning potential environmental impacts of the proposed sub-project? (Y or N)_____Were minutes recorded? (Y or N)_____

Annex 1: minutes of consultation

_____ _____

_____ _____

_____ _____

CLMU Environmental Specialist: **Date:**

SAEPF Representative (if needed): **Date:**

Annex 9. *Summary information on Consultation with Local NGOs and Project-affected groups*

Location	Objective	Invitees	Participants	Summary conclusions and Comments	Responsibility
Karakol, Issyk-kul Region	To describe the ESMF and solicit feedback	Environmental NGOs, commercial processing enterprises, farmers associations, local officials, the SAEPF, MoF, the MH, the MAM, veterinary services from rayons, sanitary-epidemiological services -	Sartova A. – leading specialist of Government's Plenipotentiary Reresentative in Issyk-Kul region; Imanaliev A. – Leading specialist of Karakol mayor's office; Gaparov K. – Chief specialist of MoAM department in Zheti-Oguz; Amoktosupov K. – Chief specialist Ak-Suu department of MoAM Toigonalieva S. – Ak-Suu district; Bekembaev T. – agriculture department; Asylbaev D. – Karakol city, "IZCVDE"; Ishenbaev T. – veterinary service department, Zheti-Ogus; Takyrbashova A. – Karakol city, jamoat Ak-Bermet, farmer; Ryskulova A. – Karakol city, jamoat Ak-Bermet, farmer; Usenaliev T. – chairman of farm Orgogor; Toktolbekova H. – Pasture department specialist, Karakol city; Balmanov A.K/ - Ak-Doba jamoat, farmer; Abdyshev Zh.A. – Chairman of OPP; Urazbekov ".A. – head of regional veterinary laboratory in Karakol; Zhyltyrova S. – coordinator of agriculture unit in Issyk-kul Region; Amanturov E.A. – farmer, village Lipenka; Kabylbekova T. – farmer, village Lipenka; Rahmanova D. – farmer, village Lipenka; Moldoalieva A. – farmer, village Lipenka; Urkunbaev K. – farmer, village Lipenka; Baisalov K. – farmer, village Bokonbaev; Kaiduev D. – inspector of State ecological technical Inspection of Cholponata, Balykchi cities in Issyk-kul region; Sharapov B. – Head of Issyk-kul Regional inspection of veterinary and phytosanitary	The project, the ESMF has been presented (PowerPoint) to participants. Mitigation measures and Institutional responsibilities for ESMF monitoring have been discussed. Participants also discussed following issues: - availability of cultural pastures for dairy cows; - urgent needs in fodder production; vaccination (in first turn) of cows which were imported for increasing of milk production; - artificial insemination aimed to improvement of cows breeds; - veterinary safety and equipment; certified seeds supply; - absence of structures for silage preparation; urgent need of provision of lands for breed herds to ensure the sustainability and etc. Environmental options and concerns have been elucidated by participants. The document has been accepted and proposed further steps for environmental training has been agreed. All participants concluded the ESMF is well prepared, takes into account all aspects of potential environmental impacts of various types of sub-projects to be supported by the new credit line, and proposes relevant mitigation measures and its implementation will have mostly positive impacts on the country dairy sector.	MoF (CLMU)/MAM (ABCC)

			safety; Orehova O.S. – company “Issyk-Kul EI”; Adankanov M.A. – veterinary department of Ak-Su district; Jumabaeva K.K. – company “Karakol Sut”, commercial Director; Isaev I.S. – veterinary department of Tyup district; Zheksheev Zh.Zh. – Tyup district, Talupsui company; Tulebaev V.A. – Ak-Suu district, farmer; Bobosunov A. – Sara-zhaz, Ak-suu district, farmer; Zhairakov B.A. – environmental specialist, Environmental department in Karakol city; Bukarova A.K. – State ecological technical Inspection of Karakol city; Bekbonotov M.B. – farmer, Ak-Suu district; Beishenalieva Zh. – specialist, agricultural company “Ala-Too sut”; Bekturova Zh.O. – company “Kait Sut” in Karakol; Sadyrbekkazi A. – environmental specialist of company “DONKA”; Akmatova K. – company “Maibulak Karakol”, representative; Inybaev Zh.D. – coordinator of OSOP in Issul-Kul region; Zhuzumalieva K. – chairman of administrative board of closed corporation “Ak-Zholga”; Sagynbekov E. – senior specialist of regional development department; Asipjanov A. – association “VIE KR”; Nogoev K.Zh. - limited liability company “Mai Bolok Karakol”, representative; Asankanov O. – Issyk-kul regional department of agricultural development; Muhambetov A.A. – chief specialist of Ton district department of agricultural development;		

			Kurmanov I. – Tyup district department of agricultural development, choef specialist; Osmonov K.L. – Issyk-kul regional department on veterinary and phitosanitary safety, specialist; Soltonkulov K.A. – OJSC “Altyn Bank”, Karakol branch, specialist; Zhamansariev K.M. – Karakol veterinary department, veterinary specialist; Uzakova E. – representative of CLMU, Ministry of finances of KR; Torobekov M. – representative of ABCC; Zhanybekov A.K. – Deputy Chairman, Government’s Plenipotentiary Reresentative in Issyk-Kul region		

Photo report on EMF public consultation

Opening of consultations by local authorities

Participants of public consultations

Presentation of ESMF document

Discussions, comments from participants during the consultations